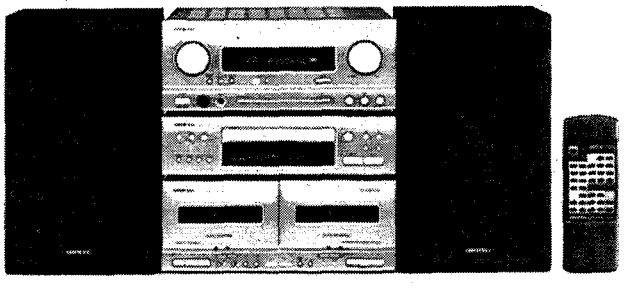
REF. NO. 3482

ONKYO SERVICE MANUAL

PERSONAL COMPONENT SYSTEM

PCS-32/PCS-22



PCS-22

PCS-32

Black and Silver models

UPV, UP	230V AC, 50Hz
UW	120 or 220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO®
AUDIO COMPONENTS

TABLE OF CONTENTS

CAUTION ON REPLACEMENT OF OPTICAL PICKUP

The laser diode in the optical pickup block is so sensitive to static electricity,surge current and etc, that the components are liable to be broken down or its reliability remarkably deteriorated.

During repair,carefulley take the following precautions. (The following precautions are included in the service parts.)

PRECAUTIONS

1.Ground for the work-desk.
Place a conductive sheet such as a sheet of copper (with inpedance lower than 10MΩ) on the work-desk and place the set on the conductive sheet so that the chassis.

2.Grounding for the test equipment and tools.
Test equipments and toolings should be grounded in order that their ground level is the same the ground of the power source.

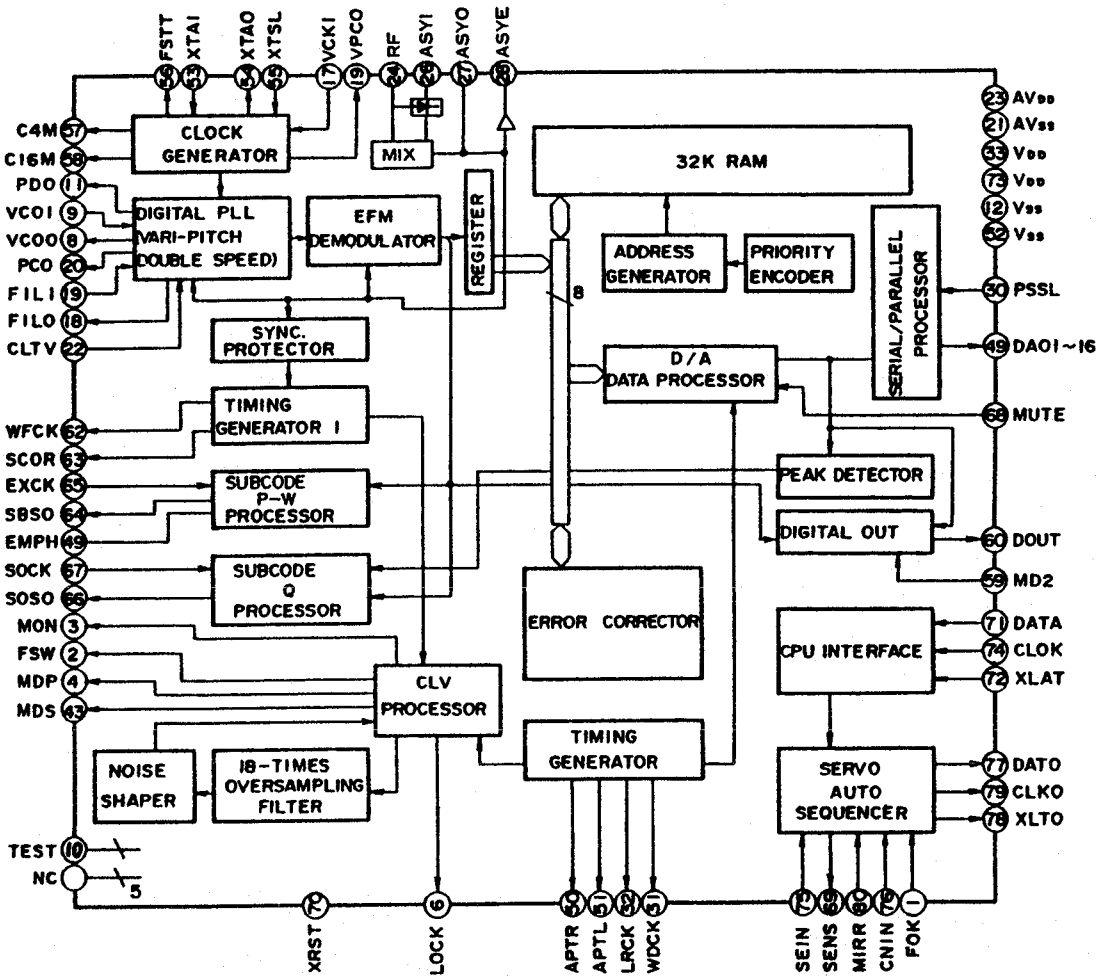
3.Grounding for the human body.
Be sure to put on a wrist-strap for grounding whose other end is grounded.
Be particularly careful when the workers wear synthetic fiber clothes, or air is dry.

4.Select a soldering iron that permits no leakage and have the tip of the iron well-grounded.

5.Do not check the laser diode terminals with the probe of a circuit tester or oscilloscope.

IC BLOCK DIAGRAMS AND DESCRIPTIONS

CXD2500AQ (Digital Signal Processor)



PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMMISION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 30cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

Laser Diode Properties

- Material: GaAlAs
- Wavelength: 760～800 nm
- Emission Duration: continuous
- Laser output: max. 0.5mW*

  *This output is the value measured at a distance about 1.8mm from the objective lens surface on the Optical Pick-up Block.

LASER WARNING LABELS

The label shown below are affixed.

1. Warning lable

This label is located on the chassis.

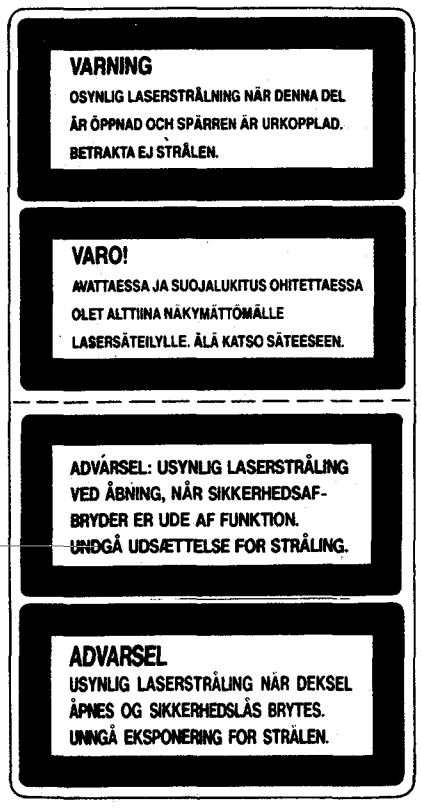
Ⓐ

DANGER —INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK FAILED OR DEFEATED. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION —HAZARDOUS LASER AND ELECTROMAGNETIC RADIATION WHEN OPEN AND INTERLOCK DEFEATED.

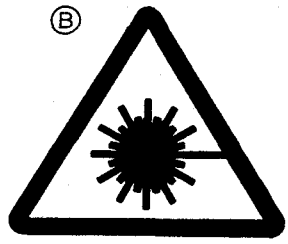
ATTENTION —RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT AVEC L ECLENCHEMENT DE SECURITE ANNULE.

Ⓒ



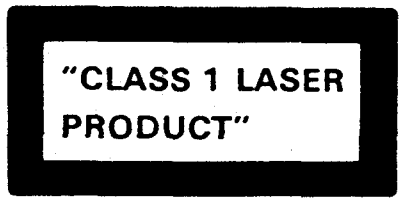
Ⓐ : Danger label
Ⓒ : Only 230V model except germany model

Ⓑ



2. Class 1 label

This label is located on the left side of top cover.



LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

ADVARSEL

Denna maekning er anbragt på apparatets højre side og indikerer, at apparatet arbejder med laserstråler af klasse 1, hvilket betyder, at der anvendes laserstråler af svageste klasse, og at man ikke på apparatets yderside kan blive udsat for utilladelig kraftig stråling.

APPARATET BØ/R KUN ÅBNES AF FAGFOLK MED SÉ RLIGT KENDSKAB TIL APPARATER MED LASERSTRÅLER!

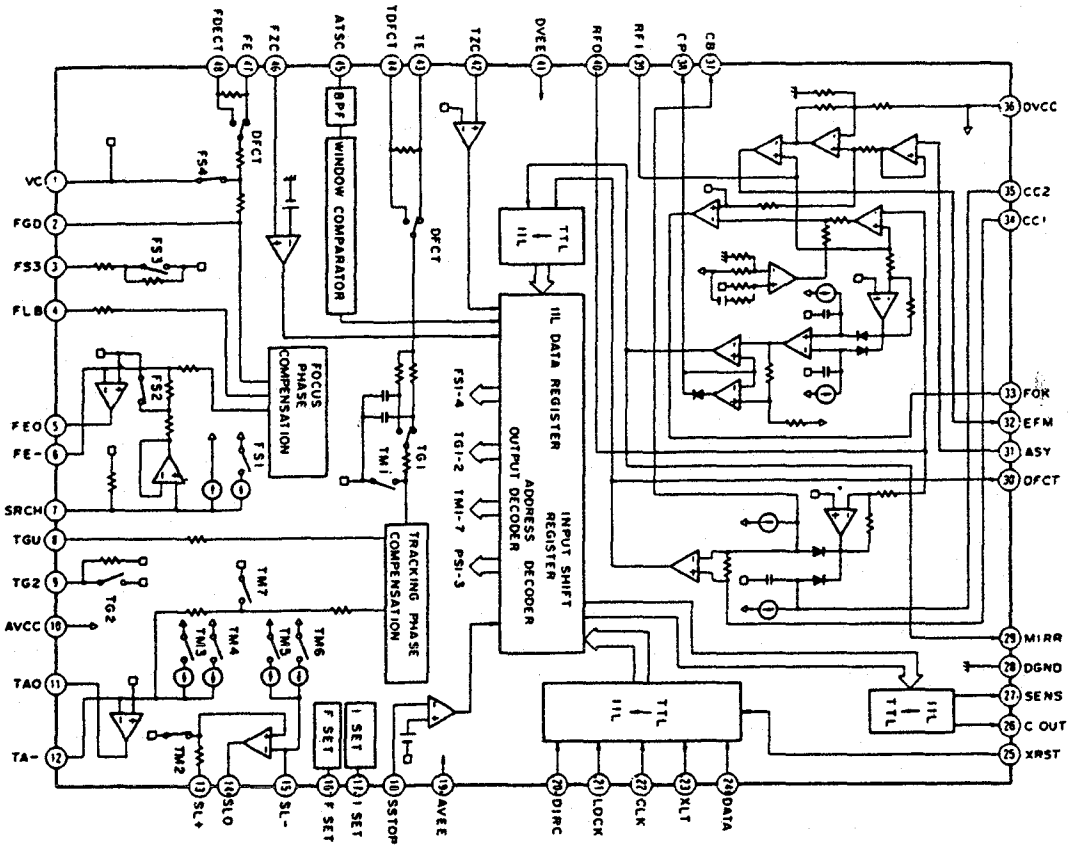
Indvendigt i apparatet er anbragt den her gengivne advarselsmérkning, som advarer imod at foretage sådnne indgreb i apparatet, at man kan komme til at udsaette sig for laserstråling.

VAROITUS! LAITTEEN KÄYTTÄMINEN MUULLA KUIN TÄSSÄ KÄYTTOOHJEESSA MAINTULLA TAVALLA SAATTAA ALTISTAA KÄYTTÄJÄN TURVALLISUUSLUOKAN 1 YLITTÄVÄLLE NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE.

NO.	SYMBOL	I/O	DESCRIPTION
1	FOK	I	Foucs Ok input
2	FSW	O	Output filter changeover output for spindle motor
3	MON	O	Spindle motor control output
4	MDP	O	Spindle motor servo control
5	MDS	O	Spindle motor servo control
6	LOCK	O	H when GFS is the high level
7	NC		
8	VCOO	O	Oscillation circuit output for analog EFM PLL.
9	VCOI	I	Oscillation circuit input for analog EFM PLL. (8.6436MHz)
10	TEST	I	Test terminal
11	PDO	O	Charge pump output analog EFM PLL
12	Vss		Ground terminal
13-15	NC		
16	VPCO	O	PLL charge pump output for variable pitch
17	VCKI	I	Clock input for variable pitch from VCO (16.934MHz)
18	FILO	O	Filter output for master PLL.
19	FILI	I	Filter input for master PLL.
20	PCO	O	Charge pump output of master PLL
21	AVss		Analog ground
22	CLTV	I	VCO control voltage input for master
23	AVDD		Analog section power supply (+5V)
24	RF	I	EFM signal input
25	BIAS	I	Asymmetry circuit constant current input
26	ASYI	I	Asymmetry comparator voltage input
27	ASYO	O	EFM full swing output
28	ASYE	I	Asymmetry control circuit
29	NC		
30	PSSL	O	Audio data output mode changeover input Serial data at L and paraller data at H.
31	WDCK	I	D/A interface for 48 bits slot. Word clock f=2Fs.
32	LRCK	I	D/A interface for 48 bits slot. LR clock f=Fs.
33	VDD		Power supply terminal (+5V)
34-49			Data output terminals
			PSSL=1 / PSSL=0
34	DA16	O	DA16 / Serial data of 48 bits slot
35	DA15	O	DA15 / Bit clock of 48 bits slot
36	DA14	O	DA14 / Serial data of 64 bits slot
37	DA13	O	DA13 / Bit clock of 68 bits slot
38	DA12	O	DA12 / LR clock of 68 bits slot
39	DA11	O	DA11 / GTOP output
40	DA10	O	DA10 / XUGF output
41	DA09	O	DA09 / XPLCK output
42	DA08	O	DA08 / GFS output
43	DA07	O	DA07 / RFCK output
44	DA06	O	DA06 / C2P0 output
45	DA05	O	DA05 / XRAOF output
46	DA04	O	DA04 / MNT 3 output
47	DA03	O	DA03 / MNT 2 output
48	DA02	O	DA02 / MNT 1 output
49	DA01	O	DA01 / MNT 0 output
50	APTR	O	Control output for aperture correction. H when R ch.
51	APTL	O	Control output for aperture correction. H when L ch.
52	Vss		Ground terminal
53	XTAI	I	Crystal oscillation circuit input of 16.9344MHz or 33.8688MHz input.
54	XTAO	O	Crystal oscillation circuit output of 16.9344MHz.
55	XTSL	I	Crystal selection input terminal. L when 16.9344MHz. H when 33.8688MHz.
56	FSTT	O	2/3 divided output of pins 53 and 54.
57	C4M	O	4.2336 MHz output
58	C16M	O	16.9344 MHz output
59	MD2	I	Digital output control input. On at high level.
60	DOUT	O	Digital output
61	EMPH	O	Emphasis control output. Active high.
62	WFCK	O	Write frame clock output
63	SCOR	O	Sub-code detection output. H when is detected SO or SI.
64	SBSO	O	Serial output of sub-code (P~W)
65	EXCK	I	Clock input for read out SQSO.
66	SQSO	O	Sub Q 80 bits, PCM peak, and level data 16 bits output.
67	SQCK	I	Clock input for read out SQSO
68	MUTE	O	Muting control output. Active H.
69	SENS		Sens output. Output to the microprocessor
70	XRST	I	System reset. Reset at the low level.
71	DATA	I	Serial data input from the microprocessor.
72	XLTA	I	Latch input from the microprocessor. Latch the serial data at the trailing.
73	VDD		Power supply treminal
74	CLOK	I	Serial data transfer clock input from microprocessor
75	SEIN	I	Sens input from SSP
76	CNCI	I	Track jump numbers count signal input
77	DATO	O	Serial data output to SSP
78	XLTO	O	Serial data latch output to SSP. Latch at trailing.
79	CLKO	O	Serial data transfer clock output to SSP.
80	MIRR	I	Mirror signal input

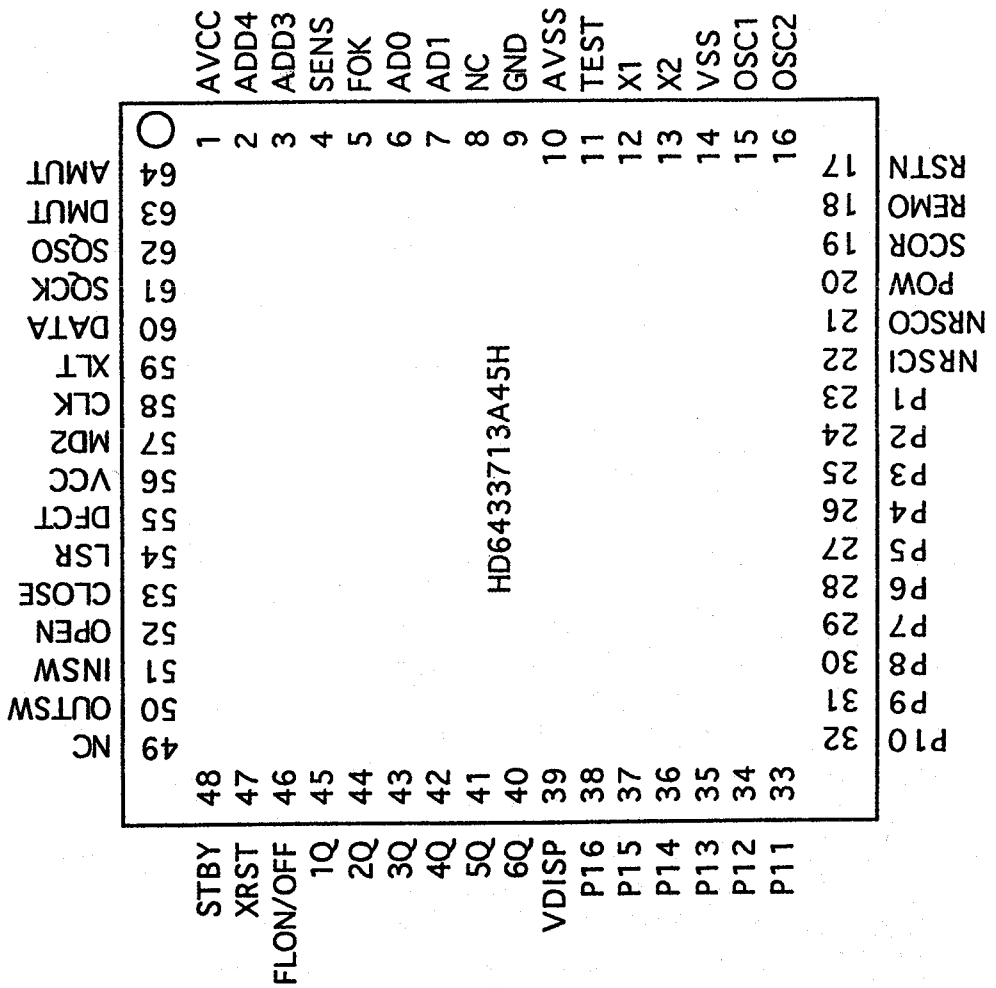
Note: SSP: IC101 CXA1372Q

CXA1372Q (Servo Signal Processor)

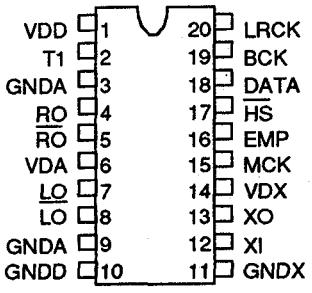


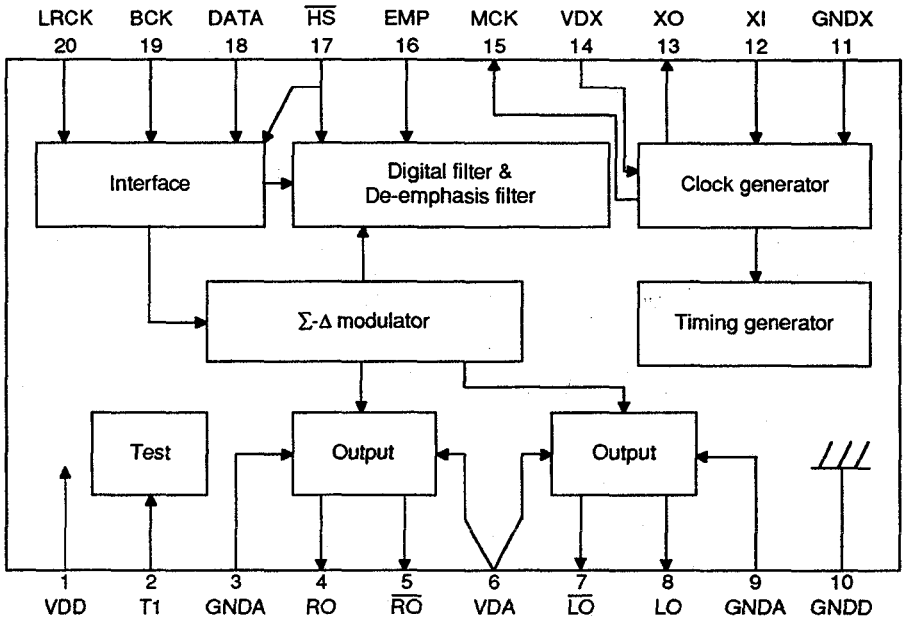
PIN NO.	SYMBOL	I/O	DESCIRPION
1	VC	I	Mid-point voltage input terminal.
2	FGD	I	Connect the capacitor between FS3 and this pin when the high frequency gain focus servo is dropped.
3	FS3	I	Focus servo high frequency gain changeover input terminal.
4	FLB	I	Input terminal for the low frequency boost of focus servo.
5	FEO	O	Focus drive output terminal.
6	FE-	I	Inversion input terminal of focus amplifier.
7	SRCH	I	Time constant terminal to make the focus search waveform.
8	TGU	I	Tracking high frequency changeover input terminal.
11	TAO	O	Tracking drive output terminal.
12	TA-	I	Inversion input terminal of tracking amplifier.
13	SL+	I	No-inversion input terminal of sled amplifier.
14	SLO	O	Sled drive output terminal.
15	SL-	I	Inversion input terminal of sled amplifier.
16	FSET	I	Peak setting input of phase correction of focus tracking.
17	ISET	I	This terminal is flowed the current so that the focus search,tarcking jump,and sled kick height is decided.
18	SSTOP	I	Inner switch selection input terminal.
20	DIRC	I	This terminal is used when track jump.
21	LOCK	I	The sled runaway prevention circuit operates at the low level.
22	CLK	I	Serial data transfer clock input from microprocessor.

PIN NO.	SYMBOL	I/O	DESCIRPION
23	XLT	I	Latch input terminal for microprocessor.
24	DATA	I	Serial data input terminal for microprocessor.
25	XRST	I	Reset input terminal.Active low.
26	C.OUT	O	Signal output to count the track numbers.
27	SENS	O	This terminal outputs FZC,and SSTOP to according command from the microprocessor.
29	MIRR	O	Mirror comparator output terminal.
30	DFCT	O	Defect comparator output terminal.
31	ASY	I	Auto asymmetry control input terminal.
32	EFM	O	EFM comparator output terminal.
33	FOK	O	Focus OK comparator output terminal.
34	CC1	O	Defect bottom hold output terminal.
35	CC2	I	Defect bottom hold input terminal from CC1.
37	CB	I	Defect bottom hold capacitor connection terminal.
38	CP	I	Mirror hold capacitor connection terminal.
39	RFI	I	RF summing amplifier input terminal.
40	RFO	O	RF summing amplifier output terminal.
42	TZC	I	Tracking zero-cross comparator input terminal.
43	TE	I	Tracking error input terminal.
44	TDFCT	I	Capacitor connection terminal for time constant when defect.
45	ATSC	I	Window comparator input terminal for ATSC detection.
46	FZC	I	Focos zero-cross comparator input terminal.
47	FE	I	Focus error input terminal.
48	FDFCT	I	Capacitor connection terminal for time constant when defect.


AVCC 1
ADD4 2
ADD3 3
SENS 4
FOK 5
AD0 6
AD1 7
NC 8
GND 9
AVSS 10
TEST 11
X1 12
X2 13
VSS 14
OSC1 15
OSC2 16
RSTN 17
REMO 18
SCOR 19
POW 20
NRSCO 21
NRSCI 22
P1 23
P2 24
P3 25
P4 26
P5 27
P6 28
P7 29
P8 30
P9 31
P10 32
P11 33
P12 34
P13 35
P14 36
P15 37
P16 38
VDISP 39
6Q 40
5Q 41
4Q 42
3Q 43
2Q 44
1Q 45
FLON/OFF 46
XRST 47
STBY 48
NC 49
OUTSW 50
INSW 51
OPEN 52
CLOSE 53
LSR 54
DFCT 55
VCC 56
MD2 57
CLK 58
XLT 59
DATA 60
SQCK 61
SQSO 62
DMUT 63
AMUT 64
HD6433713A45H

TC9268P (D/A Convertor)





NO.	SYMBOL	I/O	DESCRIPTION
1	VDD		Voltage supply terminal for digital.
2	T1	I	Test terminal. "L" when normally
3	GNDA		Ground terminal for R-ch analog.
4	RO	O	Output terminal for R-ch positive signal.
5	$\overline{RO}$	O	Output terminal for R-ch negative signal.
6	VDA		Voltage supply terminal for analog.
7	$\overline{LO}$	O	Output terminal for L-ch negative signal.
8	LO	O	Output terminal for L-ch positive signal.
9	GNDA		Ground terminal for L-ch analog.
10	GNDD		Ground terminal for digital
11	GNDX		Ground terminal for system clock oscillation.
12	XI	I	Ceramic resonator connection terminal for the system clock.
13	XO	O	
14	VDX		Voltage supply terminal for ceramic resonator.
15	MCK	O	Output terminal for system clock.
16	EMP	I	De-emphasis control input.
17	$\overline{HS}$	I	Setting the speed of action. "H"when normal, "L"when double speed.
18	DATA	I	Input terminal for DATA.
19	BCK	I	Input terminal of bit clock.
20	LRCK	I	Input terminal of LR clock.

PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-5025-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q101	22240791	HD6433713A45H
Q201	22240487 or	CXD2500AQ or
	22240487A	CXD2500BQ
Q202	24120038	GP1F32T,Opto. module
Q301	22240792	TC9268P
Q401,Q402	22240191	NJM4565D-D
Q901	780055JRC	78M05
Q902	22240018	M518943ASL
Q931	222780075MIT	M5F78M07L
	Transistors	
Q102	221281 or	DTC114YS or
	2214930 or	UM4214 or
	2213570	RN1207
Q103, Q104	2212600	DTA124ES
Q411,Q412	2212794	2SD1468-R
Q911,Q912	2211164	2SC2120-Y
Q921	2211255 or	2SC1815-GR or
	2214915	2PC1815-GR
Q922	2211504	2SA950-Y
	Diodes	
D101,D102	223163 or	1SS133 or
D104	223222	WG713A
D103	224450562	MTZ5.6B
D901-D904	22380032 or	1SR139-100 or
D912,D913	22380035	GP104003E
D941-D943		
D911	224450823	MTZ8.2C
	Resonators	
X101	3010190	CST8.00MTW, Cera lock
X301	3010112	KD6586FFB, X'tal
	Capacitors	
C101	374724734	0.047 μ F±5%,50V,Plastic
C102	374721524	1500pF±5%,50V,Plastic
C103	374721034	0.01 μ F±5%,50V,Plastic
C205, C208	393321017	100 μ F,6.3V,Elect.
C211	393344707	47 μ F,16V,Elect.
C303	393322217	220 μ F,6.3V,Elect.
C304	374721044	0.1 μ F±5%,50V,Plastic
C305	393324717	470 μ F,6.3V,Elect.
C411,C412	374721024	1000pF±5%,50V,Plastic
C413,C414	374724724	4700pF±5%,50V,Plastic
C415,C416	370136814	680pF±5%,100V,Plastic
C417,C418	393382207	22 μ F,50V,Elect.
C421,C422	374721024	1000pF±5%,50V,Plastic
C431-C434	393342217	220 μ F,16V,Elect.
C901,C902	374721044	0.1 μ F±5%,50V,Plastic
C903,C904	393344727	4700 μ F,16V,Elect.
C905	374721044	0.1 μ F±5%,50V,Plastic
C907	393381097	0.1 μ F,50V,Elect.
C909	393324717	470 μ F,6.3V,Elect.
C911	374721034	0.01 μ F±5%,50V,Plastic
C921	393321027	1000 μ F,6.3V,Elect.
C922	374722224	2200pF±5%,50V,Plastic
C931	393344707	47 μ F,16V,Elect.
C932	374721034	0.01 μ F±5%,50V,Plastic
C941,C942	393342217	220 μ F,16V,Elect.
C943	393381017	100 μ F,50V,Elect.
C951,C952	393361017	100 μ F,35V,Elect.
	Resistors	
R971,R972	452534794	0.47 Ω,1/2W,Meatl
	Sockets	
P101	25050967	NSCT-27P754
P102	25050962 or	NSCT-22P749 or
	25050894	NSCT-22P649
P103	25051247	NSCT-15P1037

DISPLAY CIRCUIT PC BOARD (NADIS-5026-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
Q701	212124	6-BT-187GK,FL tube
S701-S714	25035652	NPS-111-S604,Push switch
P701	25050933 or	NSCT-27P720 or
	25050724	NSCT-27P507
	27190929	Holder, FL

MECHANISM PC BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
IC101	24840089	CXA1372AQ,IC
IC102	22240551	LA6532M-T1,IC
IC103	22240101	M54641L,IC
RV101,102	24840085	10K,Trim resistor
SW101	24840070	Leafswitch
CN101	24840072	Connector pin
CN102	24840071	Connector socket

HD6433713A45H (Microprocessor)

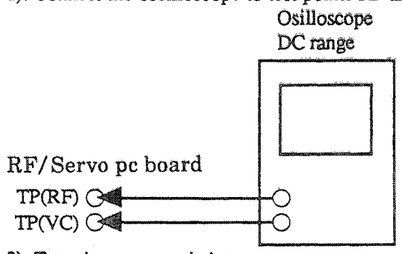
No.	Symbol	I/O	Description
1	AVCC	I	Voltage supply terminal for analog
2	ADD4		Not used
3	ADD3		
4	SENS	I	Sense signal from signal processing IC
5	FOK	I	Focus OK signal
6	AD0	I	A/D port for key input
7	AD1	I	
8	NC		Not used
9	GND		
10	AVSS	I	Reference voltage supply terminal for analog
11	TEST		Not used
12	X1		
13	X2		
14	VSS	I	
15	OSC1	I	System clock oscillation input
16	OSC2	O	System clock oscillation output
17	RSTN	I	Reset input terminal
18	REMO	I	Remote control signal input port
19	SCOR	I	Synchronizing signal detector of sub code sink
20	POW	O	Power supply control output
21	NRSCO	O	NRSC output
22	NRSCI	I	NRSC input
23	P1		
24	P2		
25	P3		
26	P4		
27	P5	O	Segment output for fluorescent indicator tube
28	P6		
29	P7		
30	P8		
31	P9		
32	P10		

No.	Symbol	I/O	Description
33	P11		
34	P12		
35	P13	O	Segment output for fluorescent indicator tube
36	P14		
37	P15		
38	P16		
39	VDISP	I	Negative voltage for FL tube
40	6Q		
41	5Q		
42	4Q	O	Digit output terminals for fluorescent indicator tube
43	3Q		
44	2Q		
45	1Q		
46	FLON/OFF	O	FL tube ON/OFF output
47	XRST	O	Reset signal
48	STBY		Not used
49	NC		
50	OUTSW	I	Tray open operation completion signal
51	INSW	I	Tray close operation completion signal
52	OPEN	O	Tray open/close control output
53	CLOSE	O	Tray open/close control input
54	LSR	O	Laser control output
55	DFCT	O	Defect control output terminal
56	VCC	I	Power supply terminal
57	MD2	O	Inhibiting signal of digital output
58	CLK	O	Serial transfer clock output terminal of command to the signal processor IC
59	XLT	O	Command to signal processing IC
60	DATA	O	Serial data of command of signal processing IC
61	SQCK	O	Serial transfer clock of sub code Q to signal processing IC
62	SQSO	I	Serial transfer data of sub code Q from signal processing IC
63	DMUT	O	Muting signal to signal processing IC
64	AMUT	O	Muting signal

ADJUSTMENT PROCEDURES

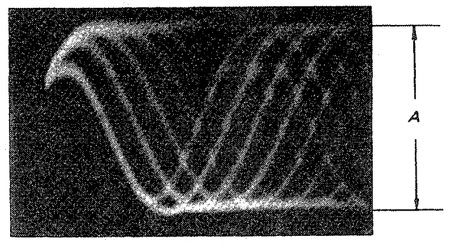
It is not necessary to perform the adjustment of optical pickup.
This confirmation should be made when replacing the optical pickup.

1). Connect the oscilloscope to test points RF and VC.



2). Turn the power switch on.
3). Load the test disc YEDS-18 on the tray and press the play button.
4). Confirm that the waveform on the oscilloscope is optimum eye pattern and optimum level as shown photo 1.
Optimum eye pattern means that shape "◇" can be clearly distinguished at the center of the waveform.

RF signal waveform



A = 1.2V ± 0.2 (Vp-p)

REFERENCE

Focus/Tracking Gain Adjustment

A frequency response analyzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no problem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up (vertical and horizontal) relative to mechanical noise and mechanical shock when the 2-axis device operate.

However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is raised, the noise when the 2-axis device operates increases.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.
- When gain adjustment is off, the symptoms below appear.

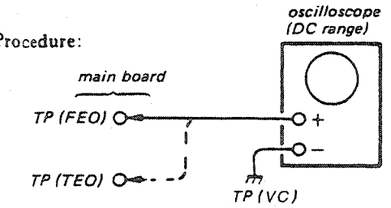
Symptoms \ Gain	Focus	Tracking
• The time until music starts becomes longer for STOP →▷PLAY or automatic selection (⏮ ⏭ buttons pressed. (Normally takes about 2 seconds.)	low	low or high
• Music does not start and disc continues to rotate for STOP→▷PLAY or automatic selection (⏮ ⏭ buttons pressed.)	–	low
• Sound is interrupted during PLAY. Or time counter display stops progressing.	–	low
• More poise during 2-axis device operation.	high	high

The following is a simple adjustment method.

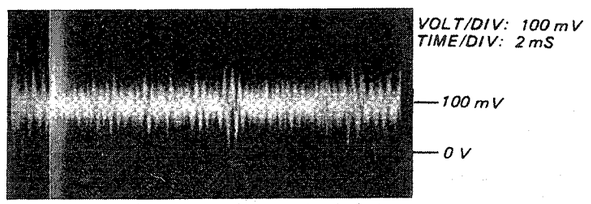
– Simple Adjustment –

Note: Since exact adjustment cannot be performed, remember the positions of the controls before performing the adjustment. If the positions after the simple adjustment are only a little different, return the controls to the original position.

Procedure:

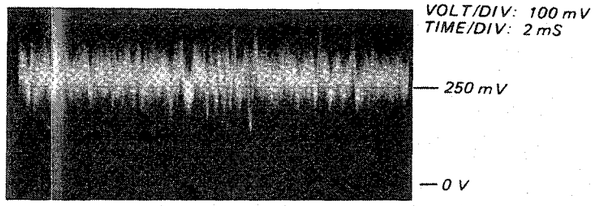


1. Keep the set horizontal.
   If the set is not horizontal, this adjustment cannot be performed due to the gravity against the 2 axis device.
2. Insert disc (YEDS-18) and press ▷PLAY button.
3. Connect oscilloscope to RF/Servo board TP (FE).
4. Adjust RV102 so that the waveform is as shown in the figure below. (focus gain adjustment)

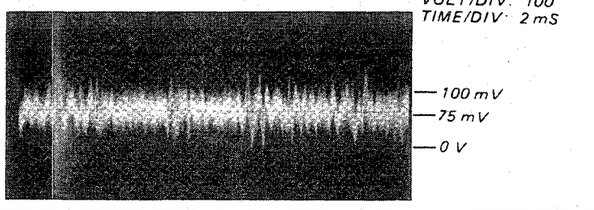


- Incorrent Examples (DC level changes more than on adjusted waveform)

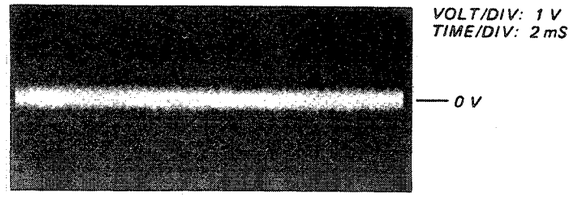
low focus gain



high focus gain

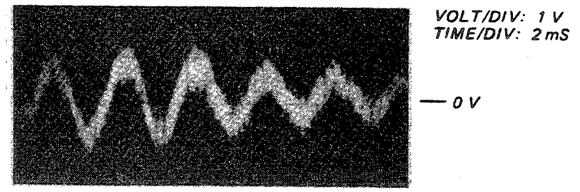


5. Connect oscilloscope to RF/Servo board TP (TE).
6. Adjust RV101 so that the waveform is as shown in the figure below. (tracking gain adjustment)

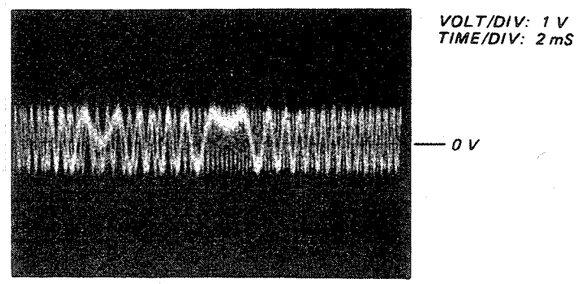


- Incorrect Examples (fundamental wave appears)

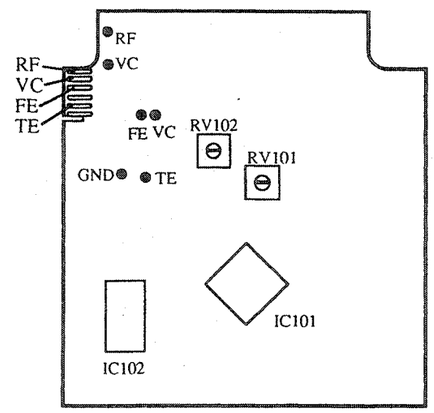
low tracking gain



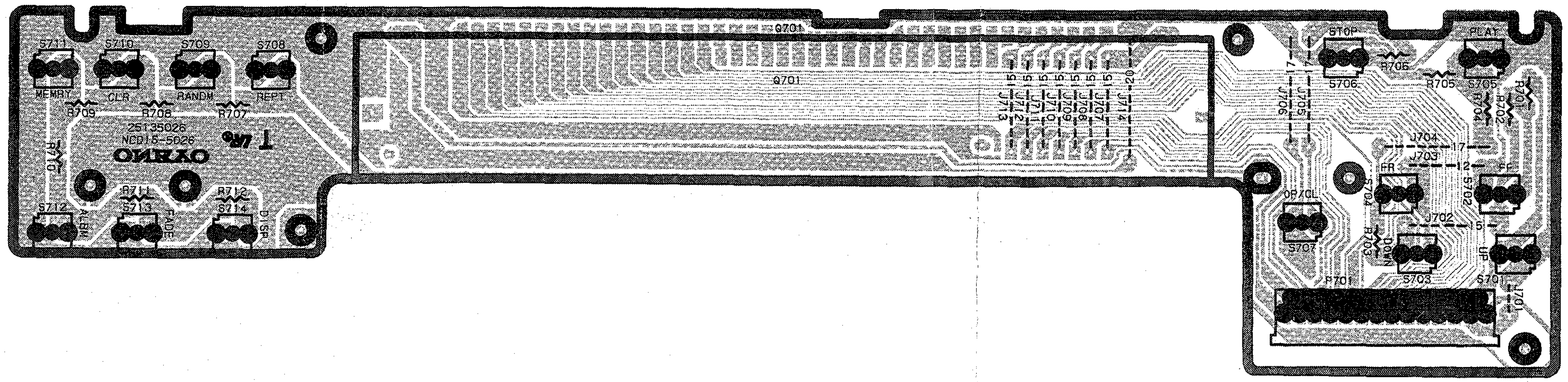
high tracking gain
(higher fundamental wave than for low gain)

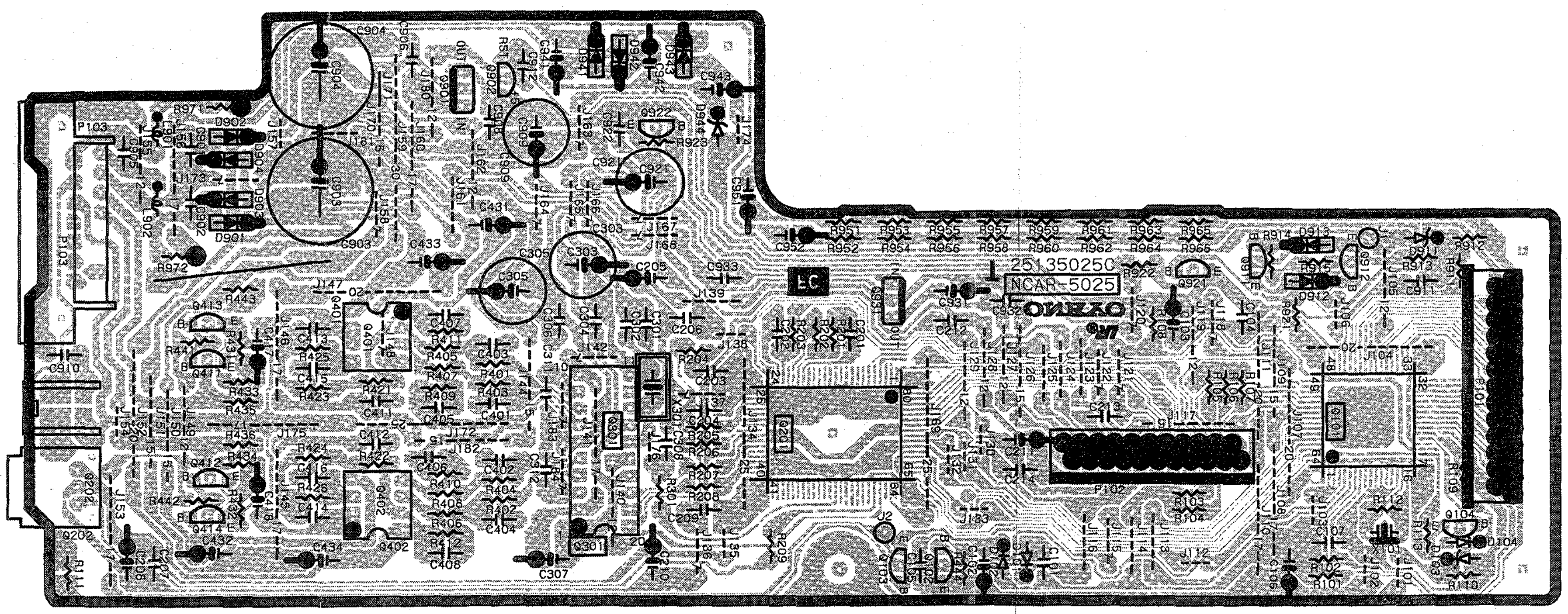


Adjustment Location: RF/Servo board

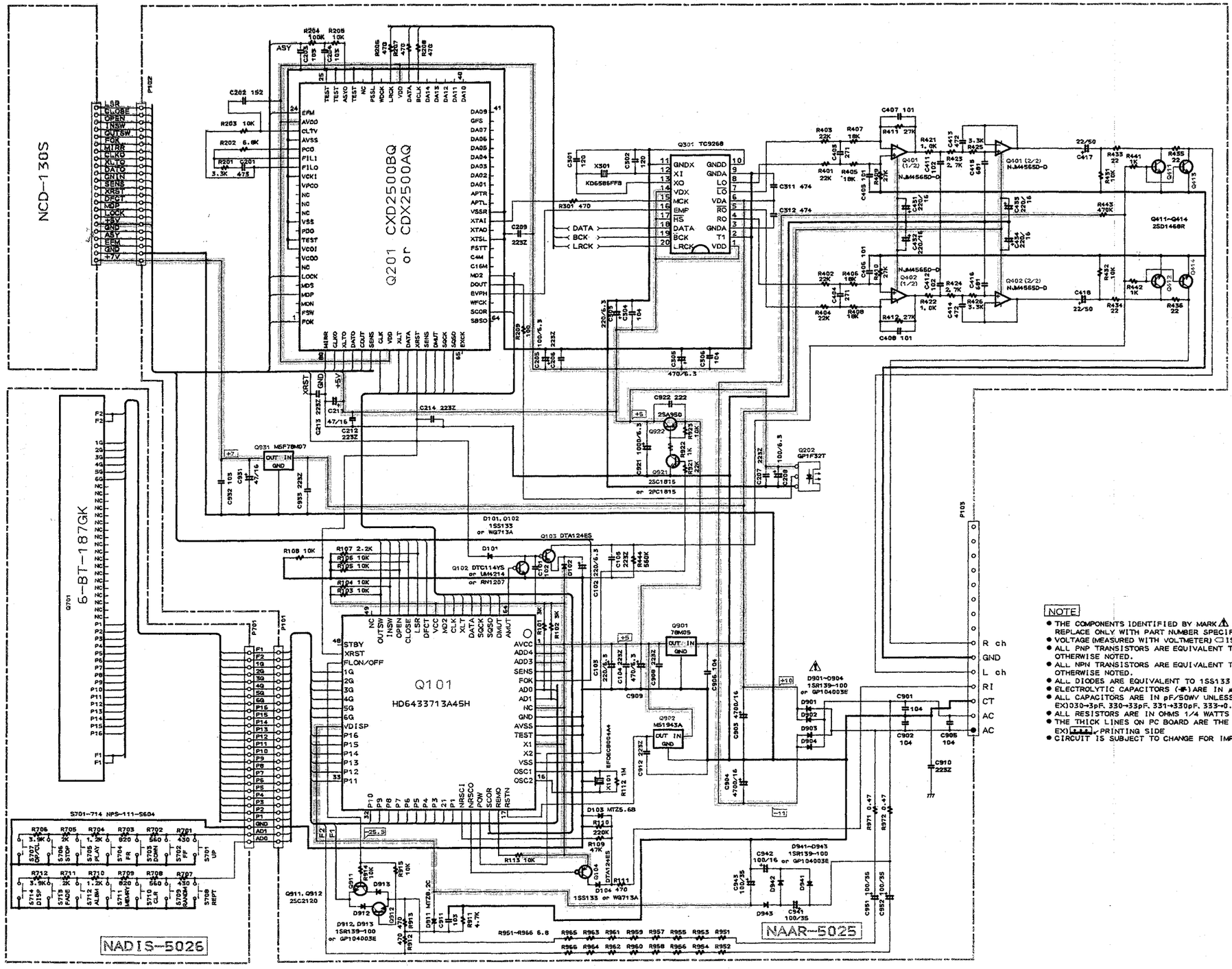


PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE





SCHEMATIC DIAGRAM

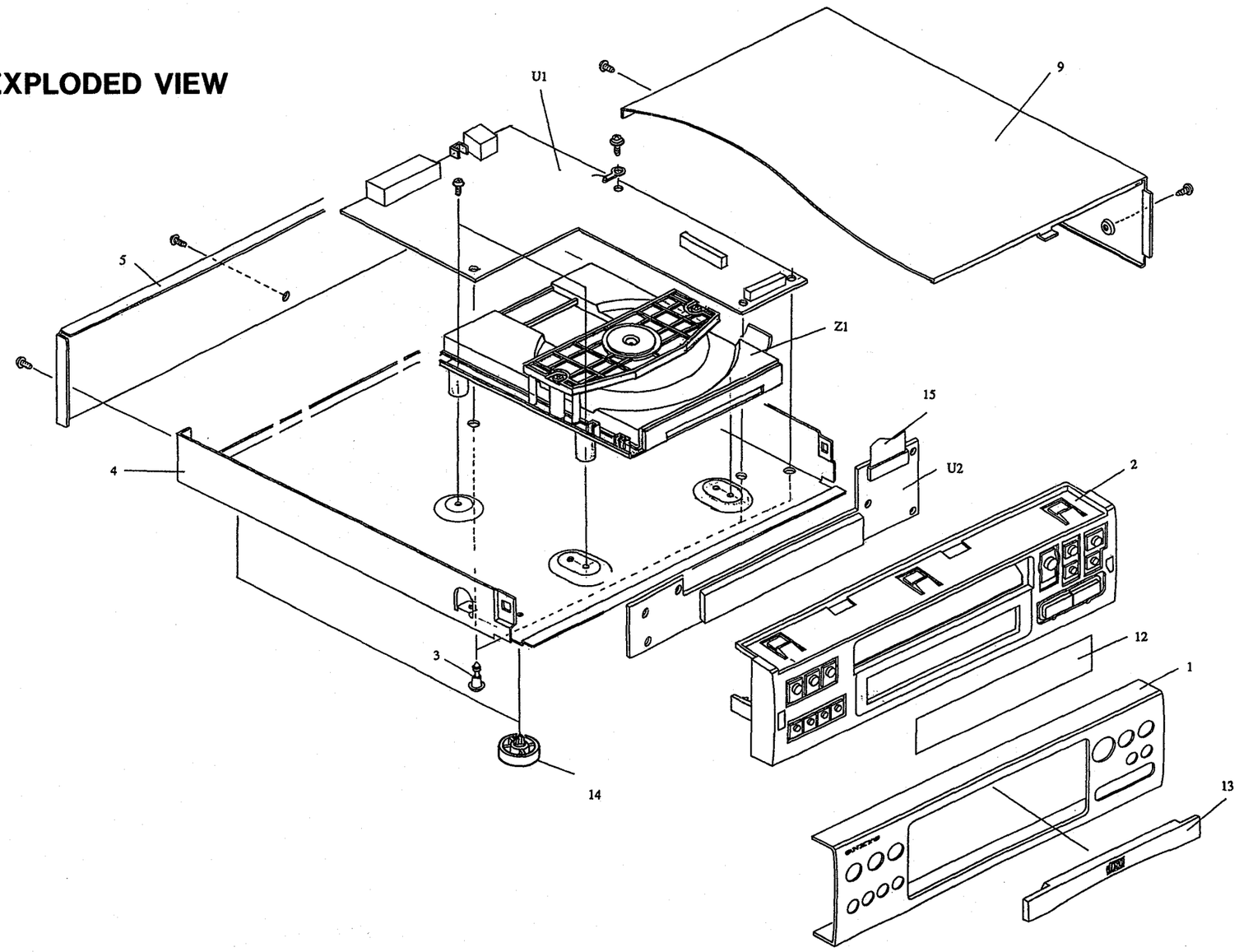


NOTE

- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE (MEASURED WITH VOLTMETER) ☐ IS DC VOLTAGE. (NO INPUT SIGNAL)
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA1015-GR UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1815-GR UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (-#) ARE IN μF/WV.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. EX) 030→3pF, 330→33pF, 331→330pF, 333→0.033μF
- ALL RESISTORS ARE IN OHMS 1/4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES ON PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EX) ▬▬ PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
1	272111611A	Front panel, B
	272111610A	Front panel, S
2	27110807	Front bracket, B
	27110806	Front bracket, S
3	27190428A	Holder,KGLS-10RF
4	27100273-1B	Chassis
5	27121891A	Rear panel
9	28184544	Cover, B
	28184545-1	Cover, S
12	28191682	Clear plate
13	28148295	Door, B
	28148294	Door, S
14	27175299A	Leg a´ssy
15	2047271012	NCFC7-271012,Flexible flat cablke
16	2046221012	NCFC6-221012,Flexible flat cable
U1	1H244525-1	NAAR-5025-1,Main pc board a´ssy
U2	1H244526-1	NADIS-5026-1,Display pc board a´ssy
Z1	24800009C	NCD-130S,Mecha a´ssy

REMOVEMENT OF TRAY ASS'Y

Remove the top cover.

Turn the locked screw to the clockwise to release the lock of gear.(Refer fig.1)

Pull out the tray ass'y.

Remove the stopper.(Refer fig.2)

Press the tray stopper to the arrow mark direction and remove the tray ass'y.

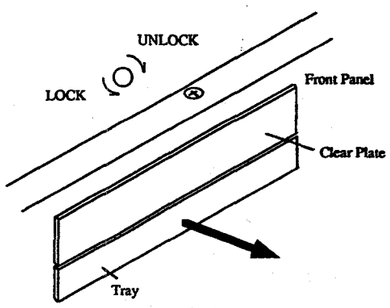


fig.1

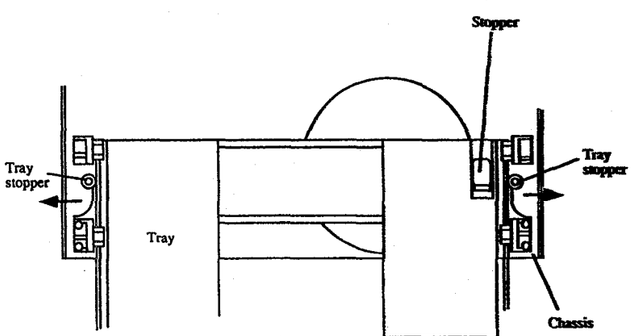
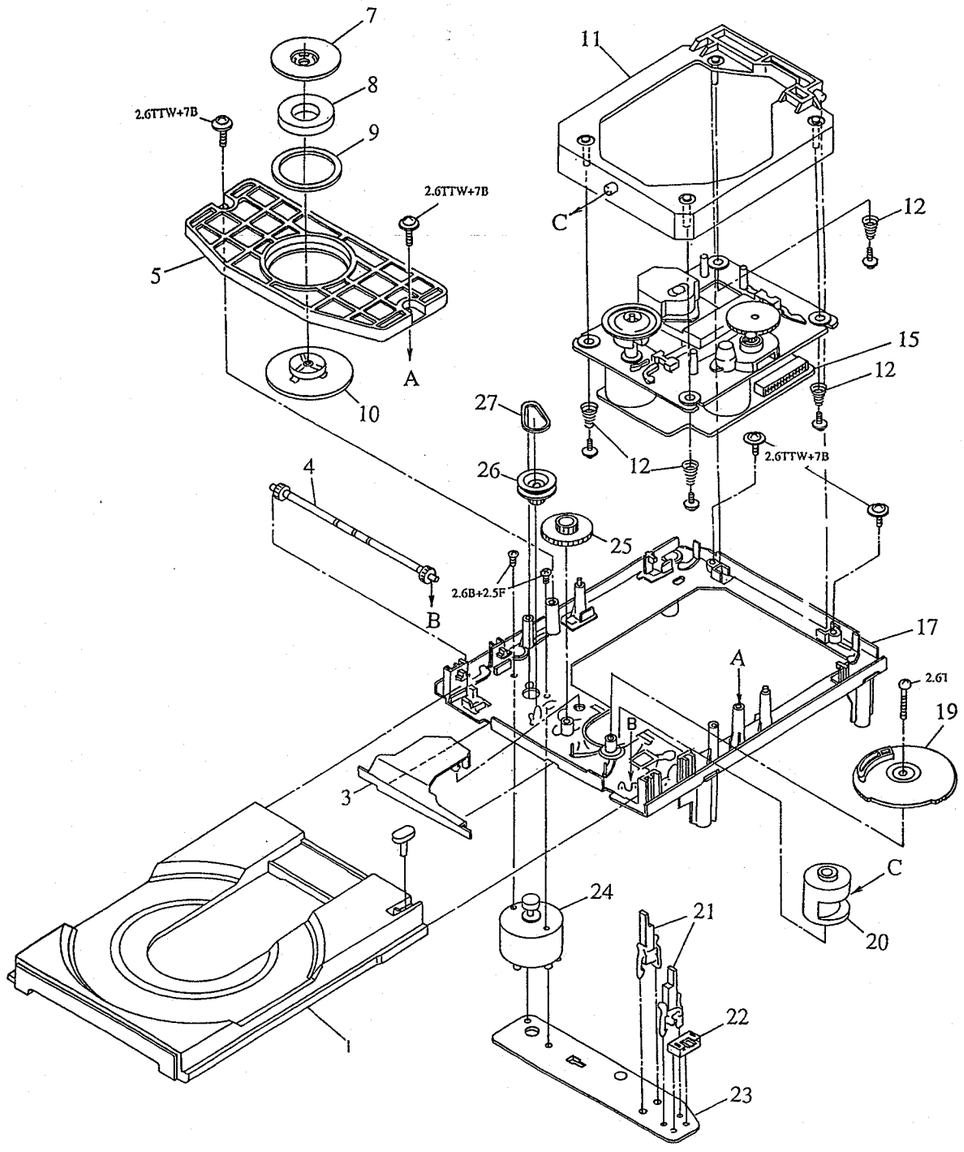
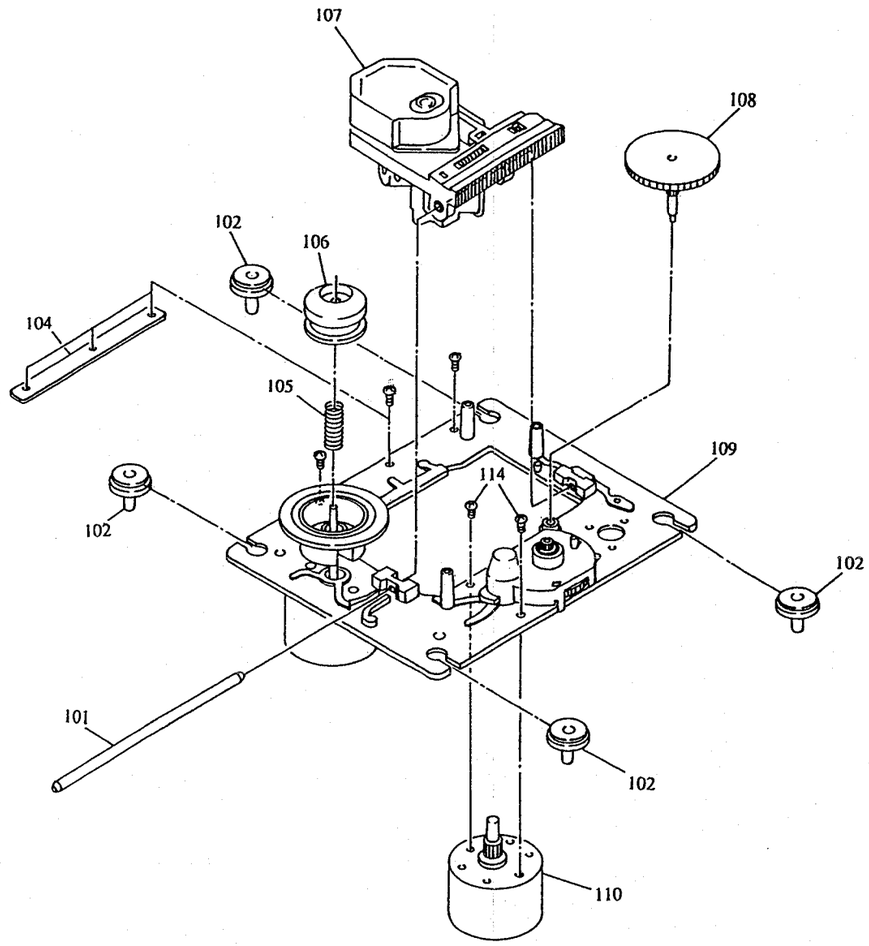


fig.2

MECHANISM-EXPLODED VIEW



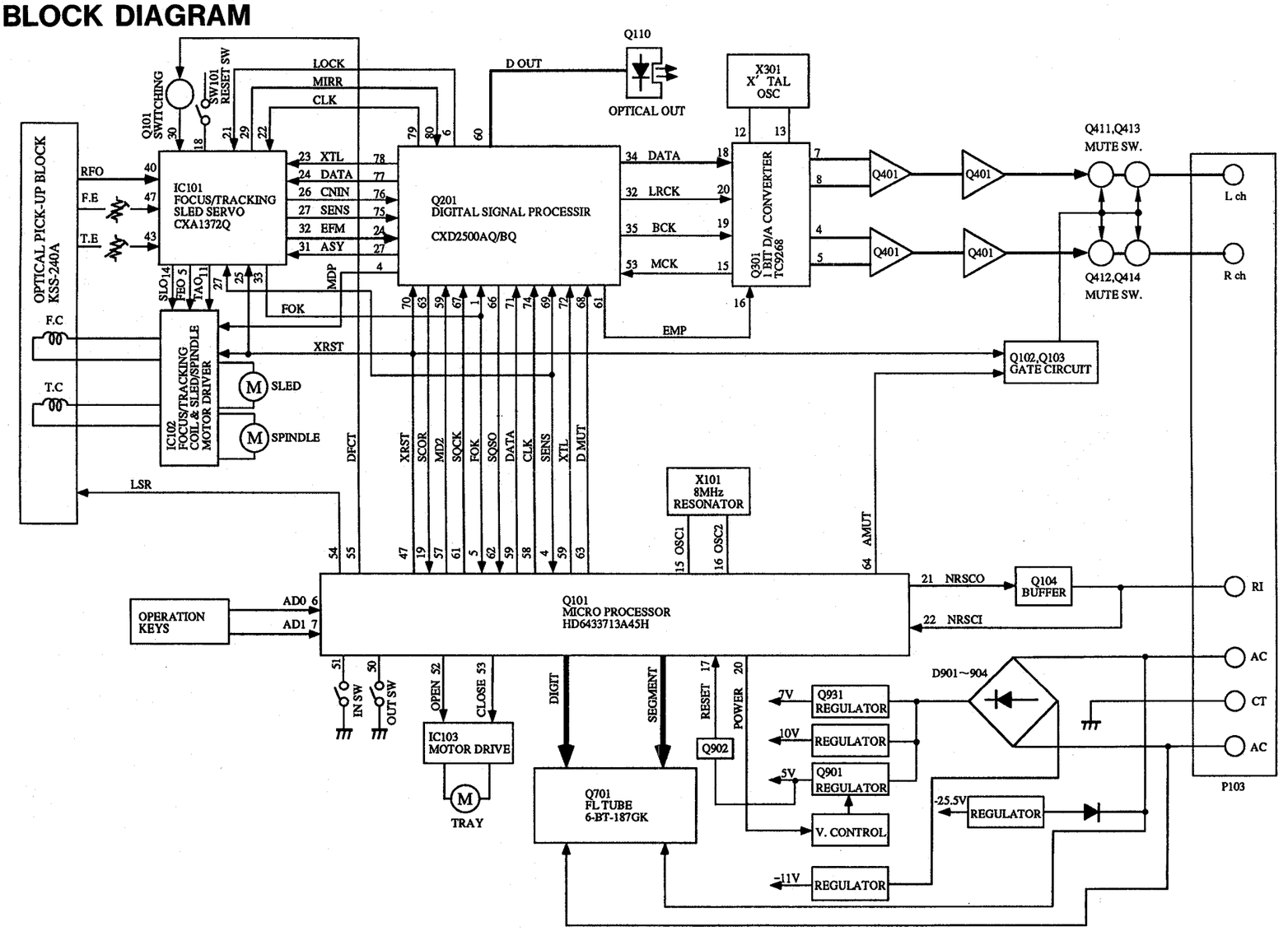


PARTS LIST

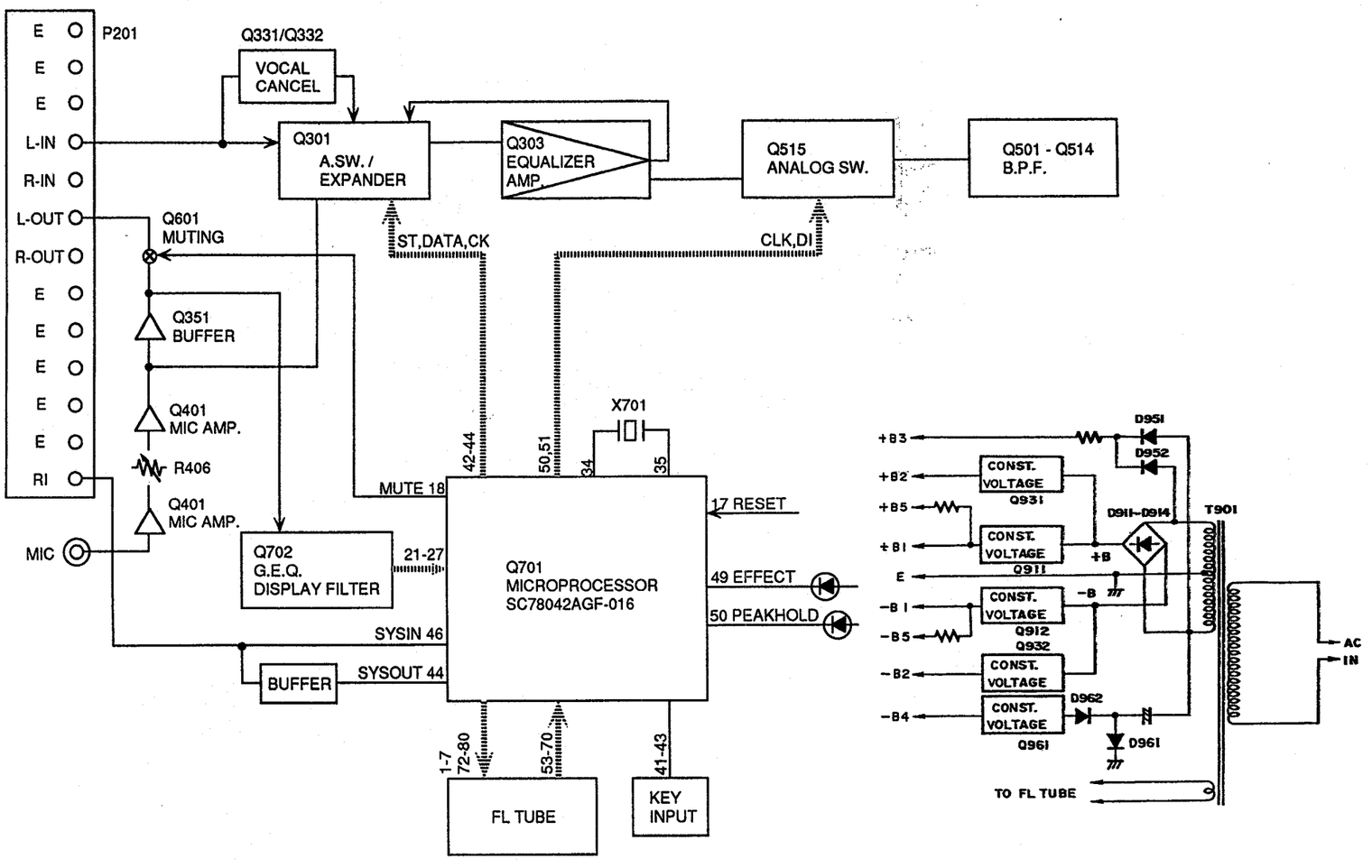
REF.NO.	PART NO.	DESCRIPTION
1	24840053	Tray
3	24822014	Gear cover
4	24810020	Tray gear
5	24840061	Chucking plate
7	24830003	Chucking yoke
8	24832004	Magnet
9	24836013	Damper
10	24810024	Chucking plate
11	24802012	Sub-chassis
12	24820023	Spring
15	24840075	CD servo pcb ass'y
17	24802013	Main chassis
19	24810021	Drive gear
20	24840063	Control cam
21	24840064	Leafswitch

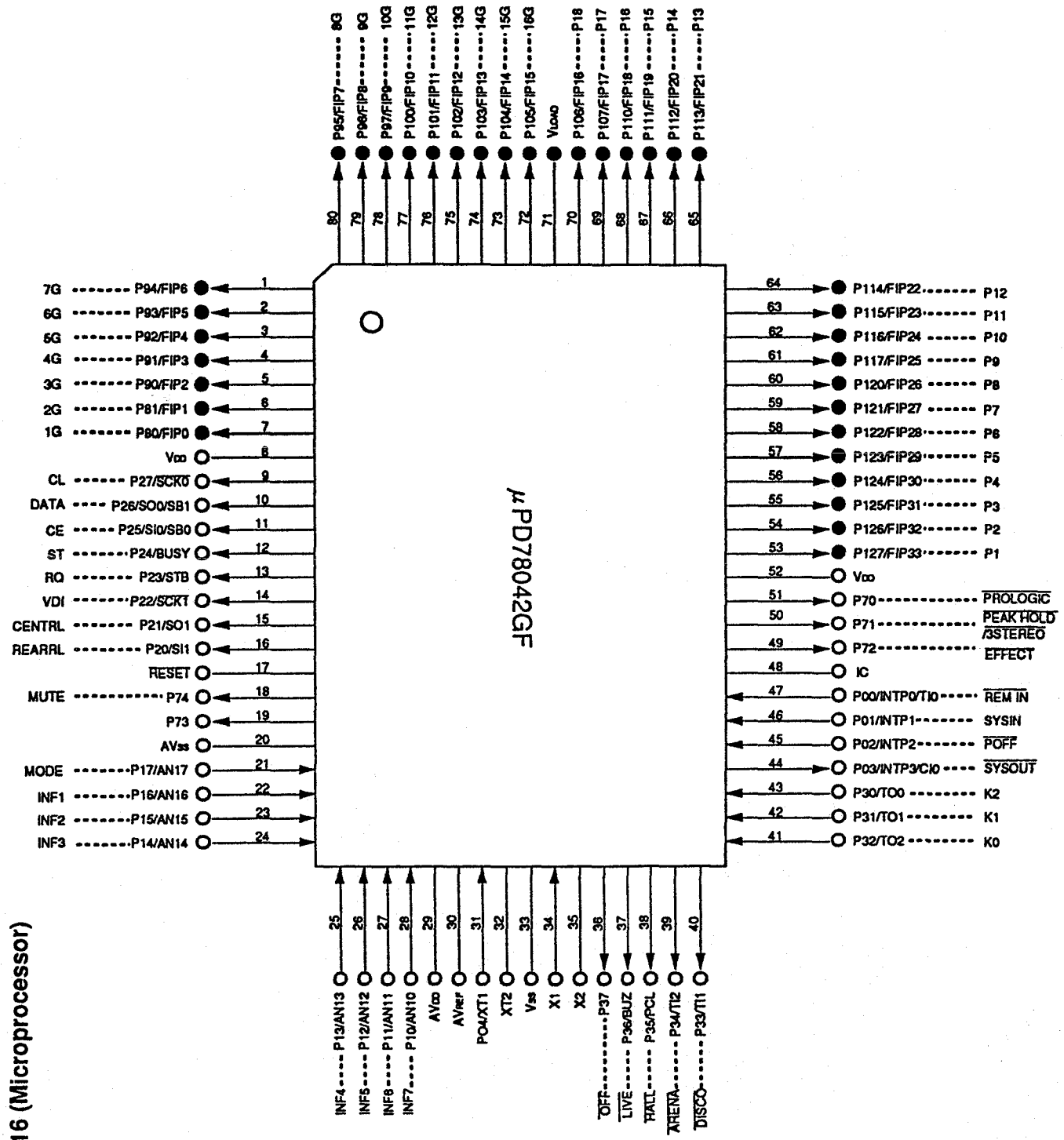
REF.NO.	PART NO.	DESCRIPTION
22	25055369	NPLG-5P352,Plug
23	24840066	Loading motor pc board
24	24840067	Loading motor
25	24810022	Middle gear
26	24810025	Loading plate
27	24816008	Belt
101	24828006	Sled shaft S
102	24836014	Insulator S
104	24822015	Plate S
105	24820024	Spring
106	24824003	Center ring
107	24110011	KSS-240A,Optical pickup
108	24810023	Wheel
109	24802014	Chassis
110	24804012	Motor gear

BLOCK DIAGRAM



BLOCK DIAGRAM

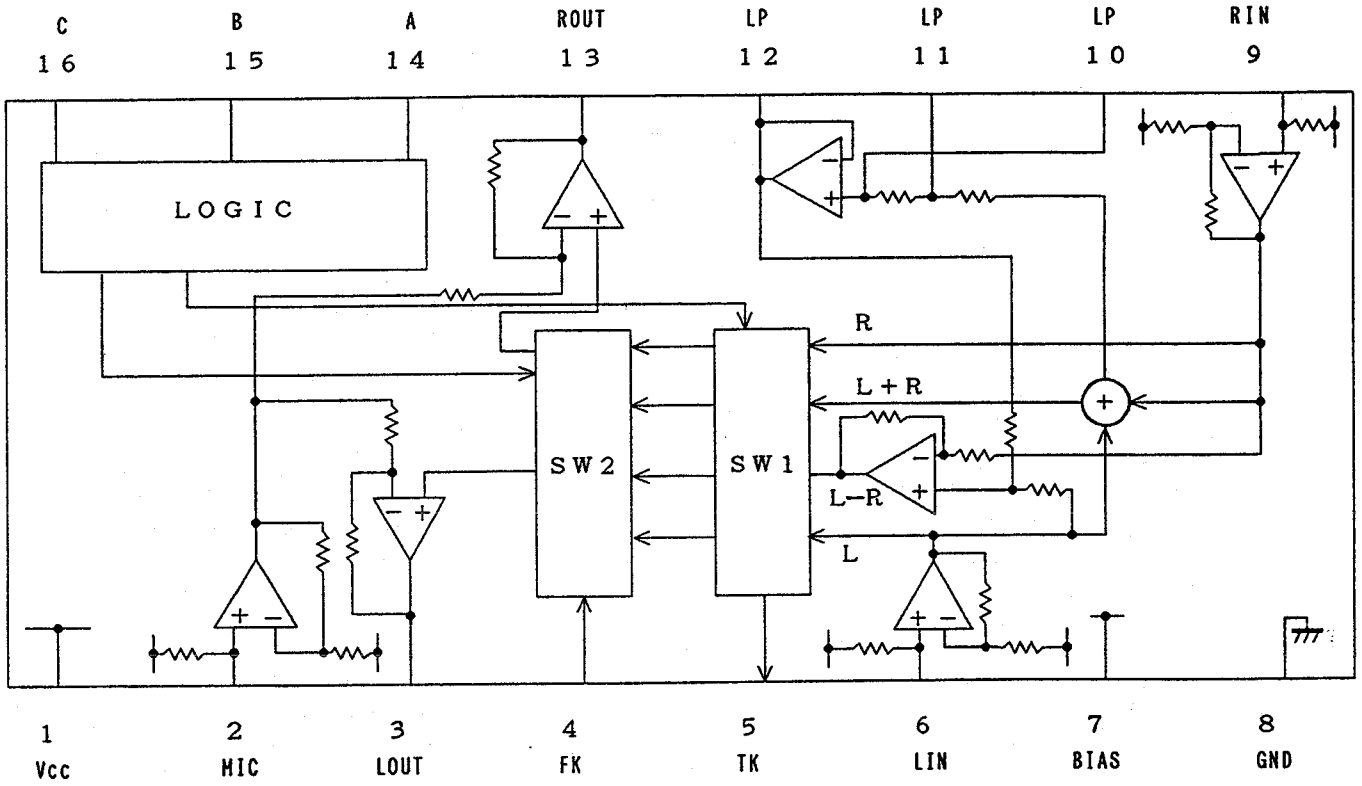




μPD78042GF-016 (Microprocessor)

BLOCK DIAGRAMS AND DESCRIPTIONS

BA3837



A #14	B #15	C #16	LOUT #3	ROUT #13	TK #5
L	L	L	MUTE	MUTE	MUTE
L	L	H	VF	VF	VF
L	H	L	L	L	L
L	H	H	L	R	L
H	L	L	MUTE	MUTE	MUTE
H	L	H	KC	KC	VF
H	H	L	KC	KC	L
H	H	H	KC	KC	L+R

L : 0V
H : 5V

VF : VOCAL FADE OUTPUT
KC : SIGNAL THROUGH KEY CONTROLLER

PRINTED CIRCUIT BOARD-PARTS LIST

Main circuit pc board assy(NAAF-5034-1,-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301	222407956 or	NJU7311AL or
	22240798	TC9162AN
Q303, Q304,	22240293 or	NJM4558L-D or
Q331*, Q351	22240247	BA15218N
Q401*		
Q332*	22240801	BA3837
Q515	22240219	LC7522
Q911	222780125	78M12HF
Q912	222790125	79M12HF
Q931	222780565JRC	78M56
Q932	222790053	79L05
	Transistors	
Q501 - Q514	2213284	2SC1740S-R
Q601, 602	2213631 or	RN1241-A or
	2213632	RN1241-B
Q603	2213510 or	DTA114ES or
	2214350	RN2202
Q961	2213354	2SA933S-R
	Diodes	
D331*, D341,	223205 or	1SS270A or
D342, D501,	223163	1SS133
D601		
D911 - D914,	22380046 or	AM01Z or
D951, D952,	22380035	GP1040003E
D961, D962		
D941, D942,	224450683	MTZ6.8C
D964		
D963	224453004	MTZ30D
	Resistors	
R406*	5104343	N09RL50KB15M
R913, 914	441622204F	RS1WBJ22
R931, 932	441621014F	RS1WBJ100
R951	442522224F	RS1/2WBJ2.2K
R952	441621024F	RS1WBJ1K
R953	442521024F	RS1/2WBJ1K
R962	442522204F	RS1/2WBJ22
	Capacitors	
C309, C310	374726824	ECQ-B50V682J, TF C
C345-346*	374721024	ECQ-B50V102J, TF C
C401-402*	374721034	ECQ-B50V103J, TF C
C503, C504	374725634	ECQ-V50V563J, TF C
C507, C508	374724734	ECQ-V50V473J, TF C
C511, C512	374722234	ECQ-B50V223J, TF C
C513, C514	374726834	ECQ-V50V683J, TF C
C515, C516	374728224	ECQ-B50V822J, TF C
C517, C518	374722734	ECQ-V50V273J, TF C
C519, C520	374723324	ECQ-B50V332J, TF C
C521, C522	374721034	ECQ-B50V103J, TF C
C523, C524	374721524	ECQ-B50V152J, TF C
C525, C526	374723924	ECQ-B50V392J, TF C
C527, C528	374725615	ECQ-B50V561K, TF C
C915, 916	354762229S	CE04W35V2200M, ELECT C
	Terminals	
P701a	25051046	NSCT-10P833
P702a	25051045	NSCT-9P832
	Jack	
P401*	25045372	LGS6517-0202

Display circuit pc board assy(NADG-5035-1,-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q701	22240802	μPD78042GF-016
Q702	22240711	XR1091ECP
	Transistors	
Q703, 704	2213560 or	RN1204 or
	221282	DTC114ES
	FL tube	
Q705	212134	BJ272GK
	Diodes	
D701 - D706,	223205 or	1SS270A or
D711 - D714	223163	1SS133
D707	224450562	MTZ5.6B
D721	225292D	SEL4310G-D
D722	225291D	SEL4910D-D
	Cera lock	
X701	3010163	CST4.19MGW
	Coils	
L711, L712	233411K220	NCH-1387
	Capacitor	
C701	3000076 or	EECS5R5T104 or
	3000078	DX-5R5L104
	Switches	
S701 - S710	25035652	NPS-111-S604
S711*		
	Terminals	
P701b	25055659	NPLG-10P615
P702b	25055658	NPLG-9P614

Voltage switch pc board assy(NASW-5037-1)

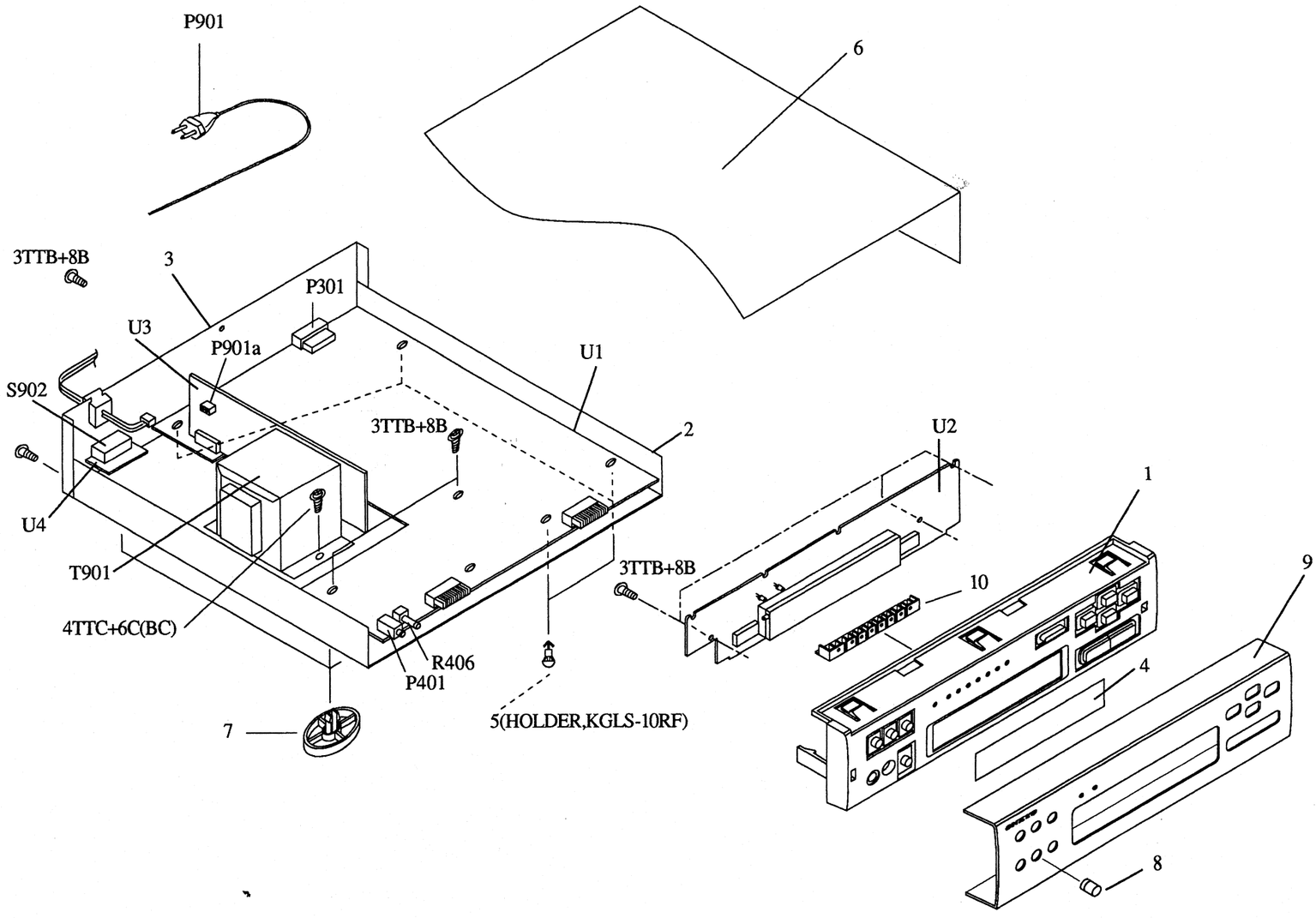
S902	25065437	NSS-22157P

NOTE:
* : <WT, PT> model only.

No.	Symbol	I/O	Description
1	G7	O	Output terminal for Digit.
2	G6		
3	G5		
4	G4		
5	G3		
6	G2		
7	G1		
8	VDD		Power supply terminal. (+5V)
9	CL	O	Output terminal to be connected with CK terminal of TC9162N, CLK terminal of LC7522.
10	DATA	O	Output terminal to be connected with DATA terminal of TC9162N.
11	CE	O	Output terminal to be connected with CE terminal of TC9162N.
12	ST		Not used.
13	RQ		
14	VDI	O	Output terminal to be connected with DI terminal of LC7522.
15	CENTRL		Not used.
16	REARRL		
17	RESET	I	Reset input terminal."L"when active.
18	MUTE	O	Audio muting output terminal."H"when active.
19			Not used.
20	AVSS		Ground terminal for A/D converter.
21	MODE	I	Initializing input terminal."L"when active.
22	INF1	I	Analog input terminal for A/D converter.
23	INF2		
24	INF3		
25	INF4		
26	INF5		
27	INF6		
28	INF7		
29	AVDD		Power supply terminal for A/D converter. (+5V)
30	AVREF		Reference voltage of A/D converter.
31	XT1		Not used.
32	XT2		
33	VSS		Ground terminal.
34	X1		Ceramic resonator connection terminal for the main system clock.
35	X2		Connect the ceramic resonator 4.19MHz.
36			Not used.
37			
38			
39			
40			

No.	Symbol		
41	K0	I	Key input terminals.
42	K1		
43	K2		
44	SYSOUT	O	Output terminal for system code."L"when active.
45	POFF	I	Input terminal for detecting power suspension.
46	SYSIN	I	Input terminal for system code."H"when active.
47	REMIN	I	Input terminal for remote control code."L"when active.
48	IC		To be connected with Ground.
49	EFFECT	O	Output terminal for EFFECT LED."L"when EFFECT ON.
50	PEAKHOLD	O	Output terminal for PEAK HOLD."L"when spectrum analyzer with peak hold.
51			Not used."L"
52	VDD		Power supply terminal. (+5V)
53	P1	O	Output terminal for Segment.
54	P2		
55	P3		
56	P4		
57	P5		
58	P6		
59	P7		
60	P8		
61	P9		
62	P10		
63	P11		
64	P12		
65	P13		
66	P14		
67	P15		
68	P16		
69	P17		
70	P18		
71	−V		Power connecting terminal.(-30V)
72	G16	O	output terminals for Digit.
73	G15		
74	G14		
75	G13		
76	G12		
77	G11		
78	G10		
79	G9		
80	G8		

EXPLODED VIEW



PARTS LIST

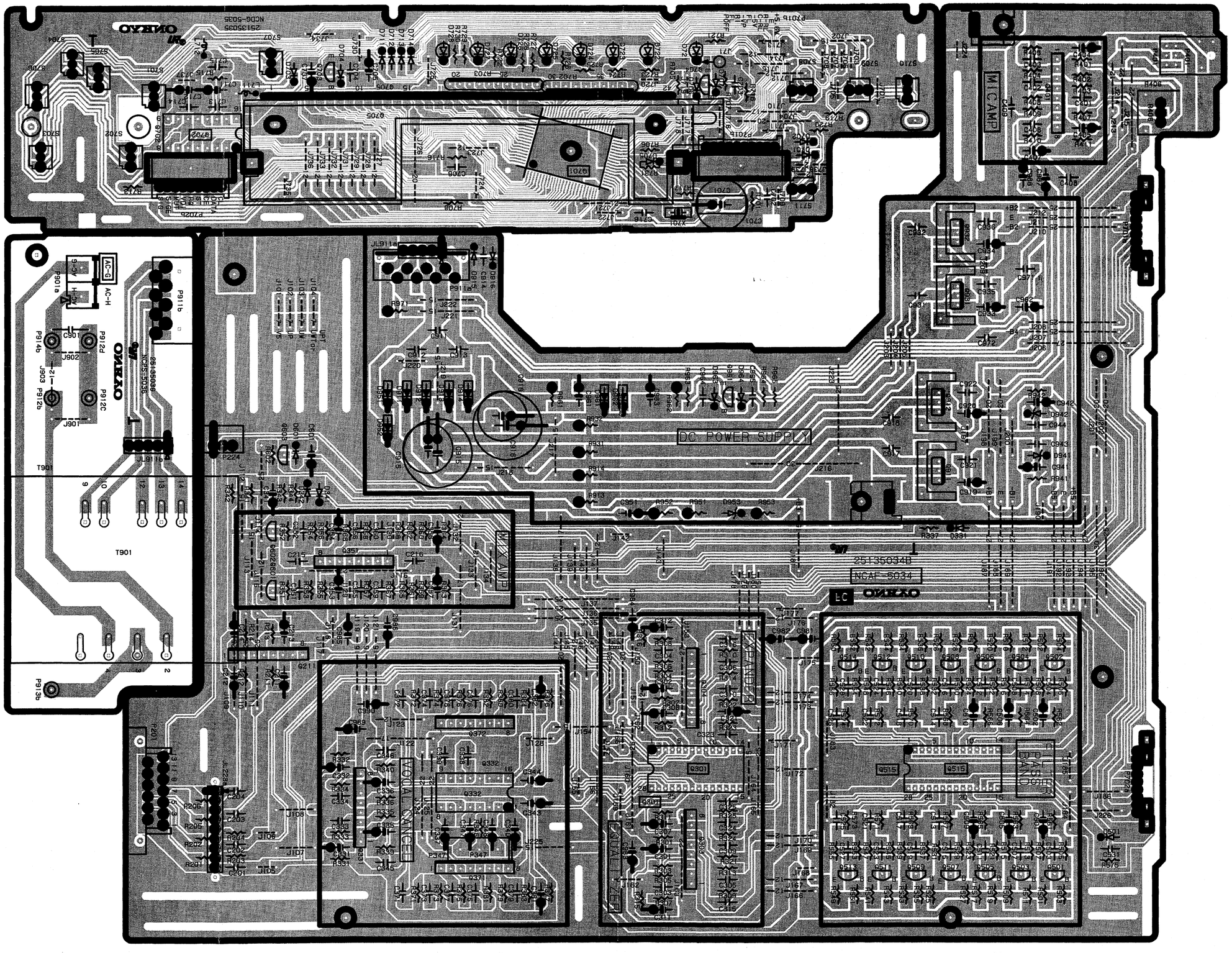
REF.NO.	PART NO.	DESCRIPTION
1	27110811	Front bracket (S)
	27110812	Front bracket (B)
2	27100288A	Chassis
3	27121909	Rear panel,<P>
	27121910	Rear panel, <W>
4	28191683	Clear plate
5	27190428A	Holder, KGLS-10RF
6	28184545-1	Cover (S)
	28184544A	Cover (B)
7	27175299A	Leg a'ssy
8	28324985	Knob (S), <WT,PT>
	28324986	Knob (B), <WT,PT>
9	27211625	Front panel (S)
	27211624	Front panel (B)
	27211652	Front panel (S), <WT,PT>
	27211653	Front panel (B), <WT,PT>
10	28198807	Facet
R406	5104343	N09RL50KB15M, Volume
P301	25051245	Socket
P401	25045372	LGS6517-0202, Mic jack

REF.NO.	PART NO.	DESCRIPTION
⚠ T901	2300924	Power transformaer, NPT-1178P, <P>
	2300925	Power transformaer, NPT-1178DG, <W>
⚠ P901	253201HIT	AC cord, AS-CEE
⚠ P901a	25055713	NPLG-2P669
U1	1W129534-1	Main pc board a'ssy, NAAF-5034-1, <P, W>
	1W129534-1A	Main pc board a'ssy, NAAF-5034-1, <WT, PT>
U2	1W129535-1	Microprocessor pc board a'ssy, NADG-5035-1, <P, W>
	1W129535-1A	Microprocessor pc board a'ssy, NADG-5035-1A, <WT, PT>
U3	1W129536-1	Power supply pc board a'ssy, NAPS-5036-1, <P, WT, PT>
	1W129536-1A	Power supply pc board a'ssy, NAPS-5036-1A,<W>
U4	1W129537-1	Voltage selector pc board a'ssy, NASW-5037-1, <W>

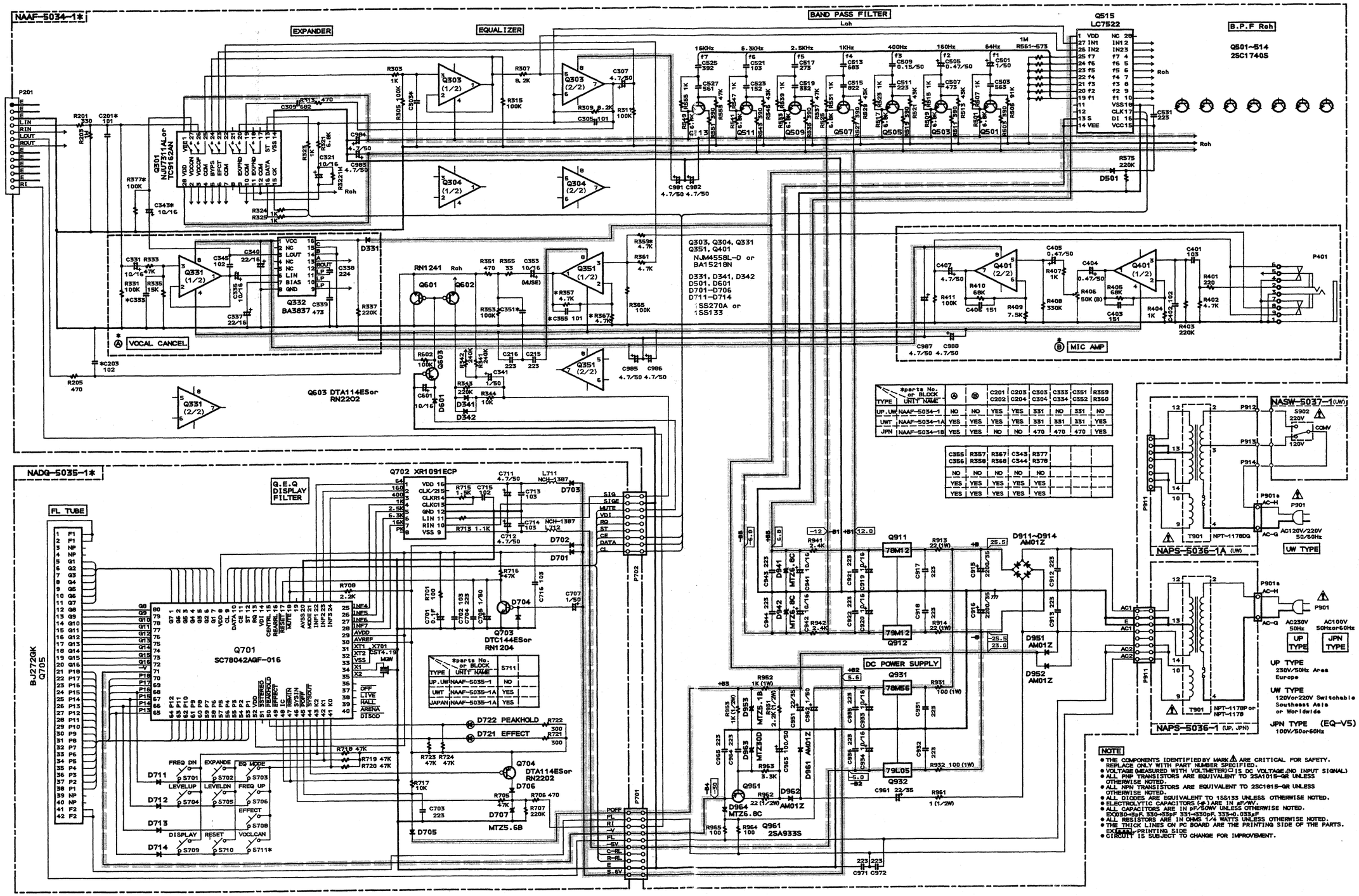
NOTE: <P> 230V model only
<W> Worldwide model only

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



SCHEMATIC DIAGRAM



ONKYO CORPORATION

IC BLOCK DIAGRAMS AND DESCRIPTIONS

MICROPROCESSOR

Pin No.	Terminal	I/O	Description	Remarks
1	T1 X1/X2	O	Speed control output of capstan motor	H:Normal speed, TAPE 1
2	T1 CAPSTAN	O	Capstan motor control output	H:On, TAPE 1
3	T1 SOLENOID	O	Solenoid coil control output	H:On, TAPE 1
4	NC			
5	T2 X1/X2	O	Speed control output of capstan motor	H:Normal speed, TAPE 2
6	T2 CAPSTAN	O	Capstan motor control output	H:On
7	T2 SOLENOID	O	Solenoid coil control output	H:On
8	DOLBY CLOCK	O	Clock output terminal for DOLBY IC	
9	DOLBY STB	O	Strobe output terminal for DOLBY IC	
10	DOLBY DATA	O	Data output terminal for DOLBY IC	
11	NC			
12	TEST		Test terminal	Connect to 5V.
13	RESET	I	Reset terminal	
14	OSC1		Ceramic resonator connection terminal	
15	OSC2		Connect the 4 MHz ceramic resonator.	
16	GND		Ground terminal	
17	X1		Not used.	
18	X2			
19	AVSS		Power source terminal for A/D converter	
20	T1 R.SENSOR	I	Signal input terminal from rotary sensor	
21	T2 R.SENSOR	I	Signal input terminal from rotary sensor	
22	Lch. LEVEL	I	A/D input terminal for input level signal	
23	Rch. LEVEL	I	This signal is used ALC and search signal.	
24	KEY 1	I	Operation key connection terminals	
25	KEY 2	I		
26	KEY 3	I		
27	KEY 4	I		
28	ALC PS LEVEL +/-	I	Fine adjustment input of automatic level control	
29	ALC LEVEL 1	I	Initializing input	
30	PS LEVEL 1	I	Refer to the table 1.	
31	PS LEVEL 2	I		
32	AVcc		Power source terminal for A/D converter	Connect to 5V.
33	Vcc		Power source terminal. (+5V)	Connect to 5V.
34	REC LED	O	REC indicator output terminal	H:On, TAPE 2
35	PAUSE LED	O	PAUSE indicator output terminal	H:On, TAPE 2
36	T2 REV LED	O	REWIND indicator output terminal	H:On, TAPE 2
37	T2 FWD LED	O	FORWARD indicator output terminal	H:On, TAPE 2
38	X2 DUB LED	O	HIGH DUBBING indicator output terminal	H:On
39	X1 DUB LED	O	NORMAL DUBBING indicator output terminal	H:On
40	T1 REV LED	O	REWIND indicator output terminal	H:On, TAPE 1
41	T1 FWD LED	O	FORWARD indicator output terminal	H:On, TAPE 1
42	T2 HIGH	O	Playback equalizer and bias current switching	TAPE 2
43	T2 NORMAL	O	output terminal. Refer to the table 2.	TAPE 2
44	BIAS CONT	O	Bias current control output terminal	
45	INPUT T1/T2	O	Input selector output terminal for TAPE-1/TAPE-2	H:TAPE 2
46	REC/PB	O	Selector output terminal for playback and recording head	
47	RI OUTPUT	O	System code output terminal	H
48	RI INPUT	I	System code input terminal	
49	DOLBY B/C	O	Dolby selector terminal	
50	DOLBY ON/OFF	O	Refer to the table 3.	
51	POWER OFF	I	Detection input terminal for a stoppage of electric current	H
52	REC MUTE	O	Muting control output terminal for recording	H
53	NC			
54	LINE MUTE	O	Line muting control output terminal	H
55	F.T. SW	I	Detection input terminal of test mode	L
56	T2 R. REC SW.	I	Mechanism switch detection input terminal	TAPE 2
57	T2 METAL SW	I	Mechanism switch detection input terminal	TAPE 2
58	T2 F.REC SW	I	Mechanism switch detection input terminal	TAPE 2
59	T2 PACK IN SW	I	Mechanism switch detection input terminal	TAPE 2
60	T2 CrO2 SW	I	Mechanism switch detection input terminal	TAPE 2
61	T2 PLAY SW	I	Mechanism switch detection input terminal	TAPE 2
62	T1 PACK SW	I	Mechanism switch detection input terminal	TAPE 1
63	T1 PLAY SW	I	Mechanism switch detection input terminal	TAPE 1
64	TEST SW	I	Detection input terminal of test mode of tape mechanism	

28 / 29	L	H
L	ALC LEVEL +1dB	ALC LEVEL -1dB
H	0dB	0dB

Pin 28:L

30 / 31	L	H
L	REC VOL +3dB	REC VOL +1dB
H	REC VOL +2dB	REC VOL 0dB

Pin 28:H

30 / 31	L	H
L	REC VOL -3dB	REC VOL -1dB
H	REC VOL -2dB	REC VOL 0dB

	43	42
Type of tape	NORMAL	HIGH
NORMAL	H	L
HIGH(CrO2)	L	H
METAL	L	L

Table 2

DOLBY ON/OFF	DOLBY B/C	DOLBY MODE
L	L	DOLBY OFF
L	H	DOLBY OFF
H	L	DOLBY B
H	H	DOLBY C

Table 3

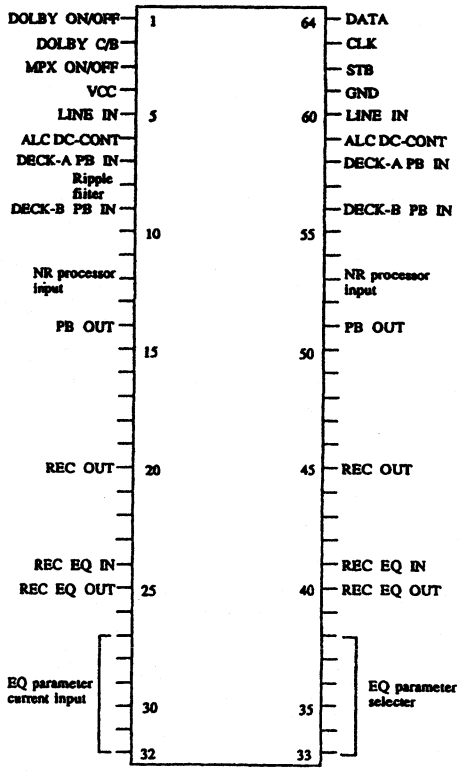
PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAR-5046-1/2)

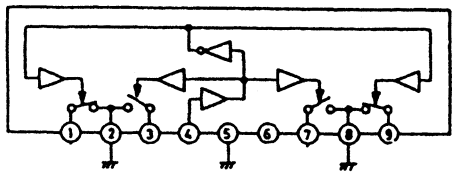
CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q101	22240767	BA3416BL
Q102	22240147	μPC1330HA
Q201	22240544	HA12155NT
Q401	222959	μPC1297CA <K-32>
Q701	22240805	HD404338A18S
Q901	222780125MAT	78M12
Q902	222780124MAT or	7812F or
	222780124JRC	7812FA
Q903	222780055MAT	78M05
	Transistors	
Q107-Q109	221281 or	DTC114YS or
Q405,Q406	2213570	RN1207
Q203,Q204	2213284,	2SC1740S-R,
	2213285,	2SC1740S-S,
	2212115 or	2SC2458-GR or
	2214915	2PC1815-GR
Q303,Q304	2211705 or	2SD655-E or
	2211706	2SD655-F
Q402-Q404	2211544	2SC1959-Y
Q407	2212853 or	2SB1068-K or
Q704,Q705	2212855	2SB1068-U
Q408	221281 or	DTC114YS or
Q702,Q703	2213570	RN1207
Q603,Q604	2213090 or	DTA114YS or
Q718,Q904	2213590	RN2207
Q706,Q709	2213354,	2SA933S-R,
Q714,Q717	2213355,	2SA933S-S,
	2212125 or	2SA1048-GR or
	2214905	2PA1015-GR
Q707,Q708	221281 or	DTC114YS or
Q710,Q711	2213570	RN1207
Q712,Q713	2212853 or	2SB1068-K or
	2212855	2SB1068-U
Q715,Q716	221281 or	DTC114YS or
Q718-Q721	221281 or	DTC114YS or
Q905	2213570	RN1207
	Diodes	
D701,D703	223163,	1SS133,
D704,D913	223205 or	1SS270A or
D914,D916	223222	WG713A
D702	224450562	MTZ5.6B
D905-D912	22380035	GP104003E
D915	224450562	MTZ5.6B
	Resonator	
X701	3010150	CST4.00MGW,Ceramic

CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils	
L101,L102	231089	NCH-2137
L201,L202	233407	NMC-6079
L401,L402	231127	NCH-4183 <K-32>
L403	231215	NLO-2059
L405,L406	231165	NTR-6506
	Capacitors	
C107,C108	393342217	220μF,16V,Elect.
C109,C110	374723334	0.033μF±5%,50V,Plastic
C111,C112	374721534	0.015μF±5%,50V,Plastic
C113,C114	374726814	680pF±5%,50V,Plastic
C115,C116	393341007	10μF,16V,Elect.
C117,C118	374723315	330pF±10%,50V,Plastic
C119,C120	374721015	100pF±10%,50V,Plastic
C121,C122	393380107	1μF,50V,Elect.
C123	393341007	10μF,16V,Elect.
C124	393342207	22μF,16V,Elect.
C125	393344717	470μF,16V,Elect.
C130,C228	374722734	0.027μF±5%,50V,Plastic
C201,C202	393380107	1μF,50V,Elect.
C203-C208	374722224	2200pF±5%,50V,Plastic
C209-C214	374721044	0.1μF±5%,50V,Plastic
C215,C216	393341017	100μF,16V,Elect.
C217,C218	393382297	0.22μF,50V,Elect.
C219-C222	393380107	1μF,50V,Elect.
C224	393380107	1μF,50V,Elect.
C225,C903	393342217	220μF,16V,Elect.
C301,C302	393380107	1μF,50V,Elect.
C307,C308	393341007	10μF,16V,Elect.
C401-C404	374723334	0.033μF±5%,50V,Plastic <K-32>
C405,C406	374721034	0.01μF±5%,50V,Plastic <K-32>
C411,C412	370131214	120pF±5%,100V,Plastic <K-32>
C415,C416	393341007	10μF,16V,Elect. <K-32>
C418	374721834	0.018μF±5%,50V,Plastic
C419,C421	374724724	4700pF±5%,50V,Plastic
C420	374722234	0.022μF±5%,50V,Plastic
C423	393341017	100μF,16V,Elect.
C424	393322211	220μF,6.3V,Elect.
C427,C428	393341007	10μF,16V,Elect.
C429	370131234	0.012μF±5%,100V,Plastic
C702,C904	393341007	10μF,16V,Elect.
C706,C712	393321017	100μF,6.3V,Elect.
C901	374722734	0.027μF±5%,50V,Plastic
C902	393354727	4700μF,25V,Elect.
C906,C907	393341007	10μF,16V,Elect.
C908,C910	393362207	22μF,35V,Elect.
C909	393382297	0.22μF,50V,Elect.
C912	393342227	2200μF,16V,Elect.
C914	374721044	0.1μF±5%,50V,Plastic

HA12155NT (DOLBY NR)



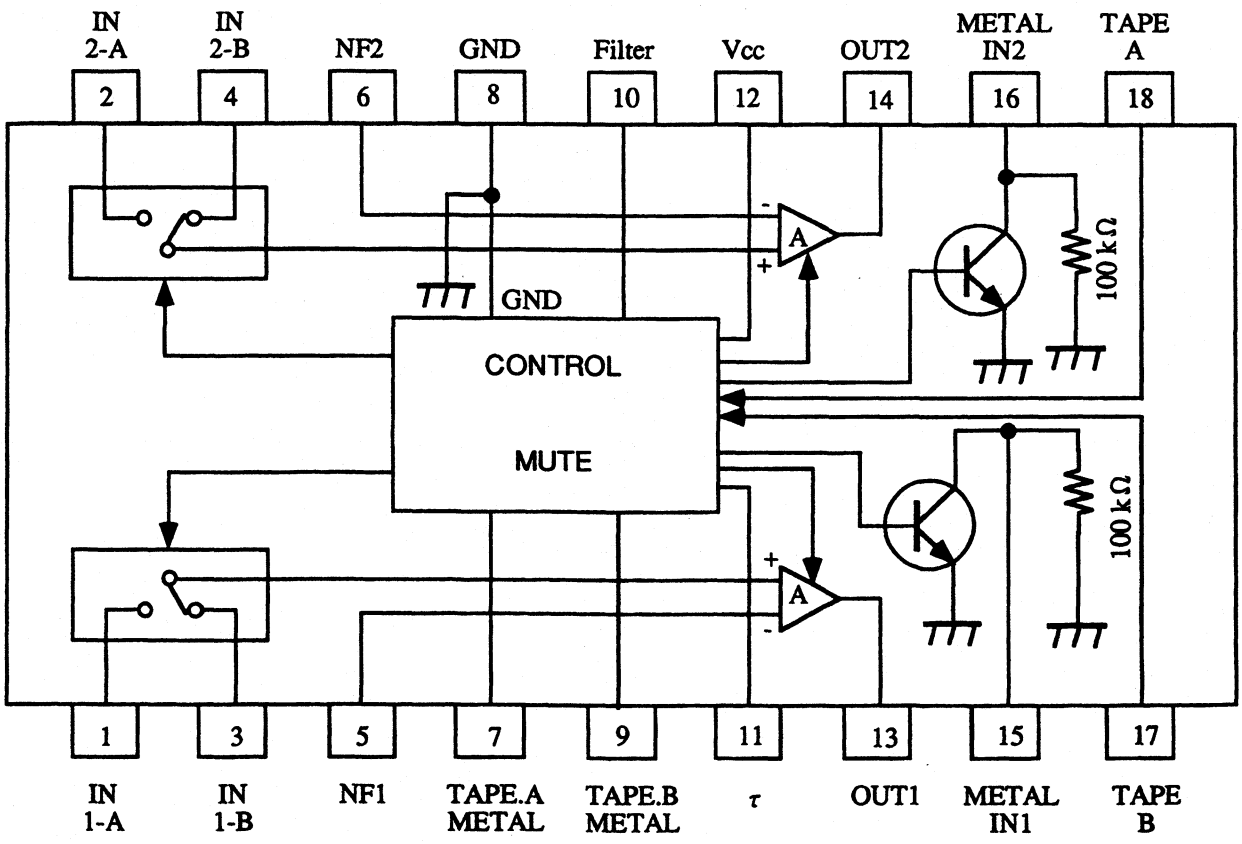
μPC1330HA (REC/PB SW)



μPC1330HA

Pin No.	Function
1, 9	PB. signal
2	GND
3, 7	REC signal
4	REC/PB SW control
5	GND
6	+B
8	GND

BA3416BL (Dual Playback Preamplifier)



CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R119,R120	5210265	N06HR50KBC,Trim
R124	443521514	150 ohm±5%,1/2W,Metal oxide
R215,R216	5210263	N06HR20KBC,Trim
R403,R404	5210262	N06HR10KBC,Trim <K-32>
R425,R426	5210266	N06HR100KBC,Trim <K-22>
R702	49163392410	3.9 kohm×10,1/10W,Array
R703	49163392408	3.9 kohm×8,1/10W,Array
R730,R739	5210258	N06HR1KBC,Trim
R731,R740	5210259	N06HR2KBC,Trim
R901	443521004	10 ohm±5%,1/2W,Metal oxide
R904	443624714	470 ohm±5%,1W,Metal oxide
	Plugs	
P101	25055715	NPLG-3P671
P102	25055138	NPLG-8P122
P201	25055038	NPLG-2P29
P703,P704	25055445	NPLG-7P427
	Sockets	
P103	25051247	NSCT-15P1037
P701	25051104	NSCT-10P891
P702	25051129	NSCT-13P916

OPERATION SWITCH PC BOARD (NASW-5047-1)

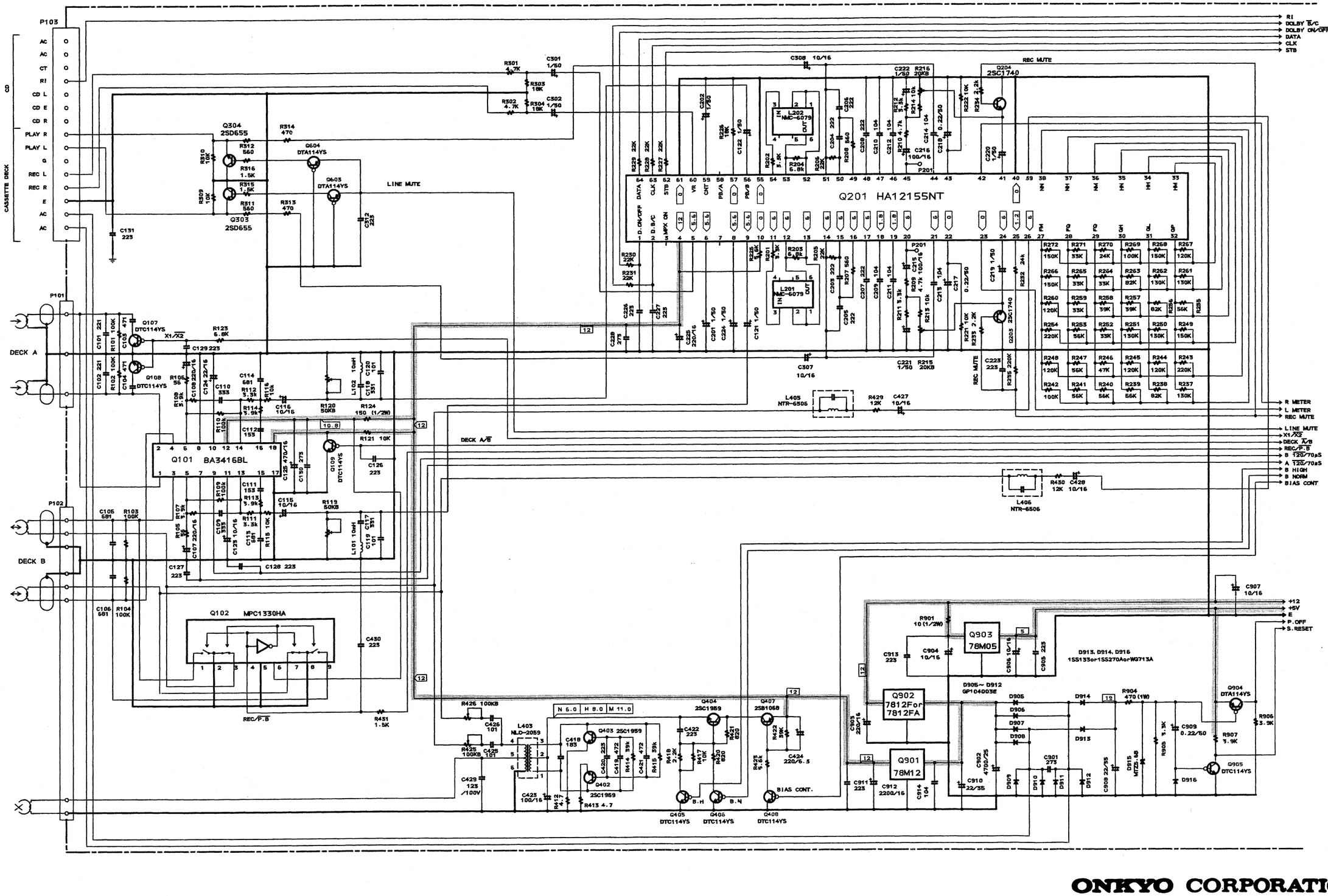
CIRCUIT NO.	PART NO.	DESCRIPTION
	LEDs	
D801,D802	225256B,	SEL3410E-B,
	225256C or	SEL3410E-C or
	225256D	SEL3410E-D
D803,D804	225255B,	SEL3110S-B
	225255C or	SEL3110S-C or
	225255D	SEL3110S-D
	Switches	
S801-S807	25035659	NPS-111-S611
S808	25065344	NSS-12134
S809	25065346	NSS-13135
	Socket	
P703A	2009990339	NSAS-14P0475
	Clamp	
	27301642	X-4-3U

OPERATION SWITCH PC BOARD (NASW-5048-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	LEDs	
D851,D852	225256B,	SEL3410E-B,
D851,D852	225256C or	SEL3410E-C or
D851,D852	225256D	SEL3410E-D
D853,D854	225255B,	SEL3110S-B
D853,D854	225255C or	SEL3110S-C or
D853,D854	225255D	SEL3110S-D
	Switches	
S851-S857	25035659	NPS-111-S611
	Socket	
P704A	2009990340	NSAS-14P0476
	Clamp	
	27301642	X-4-3U

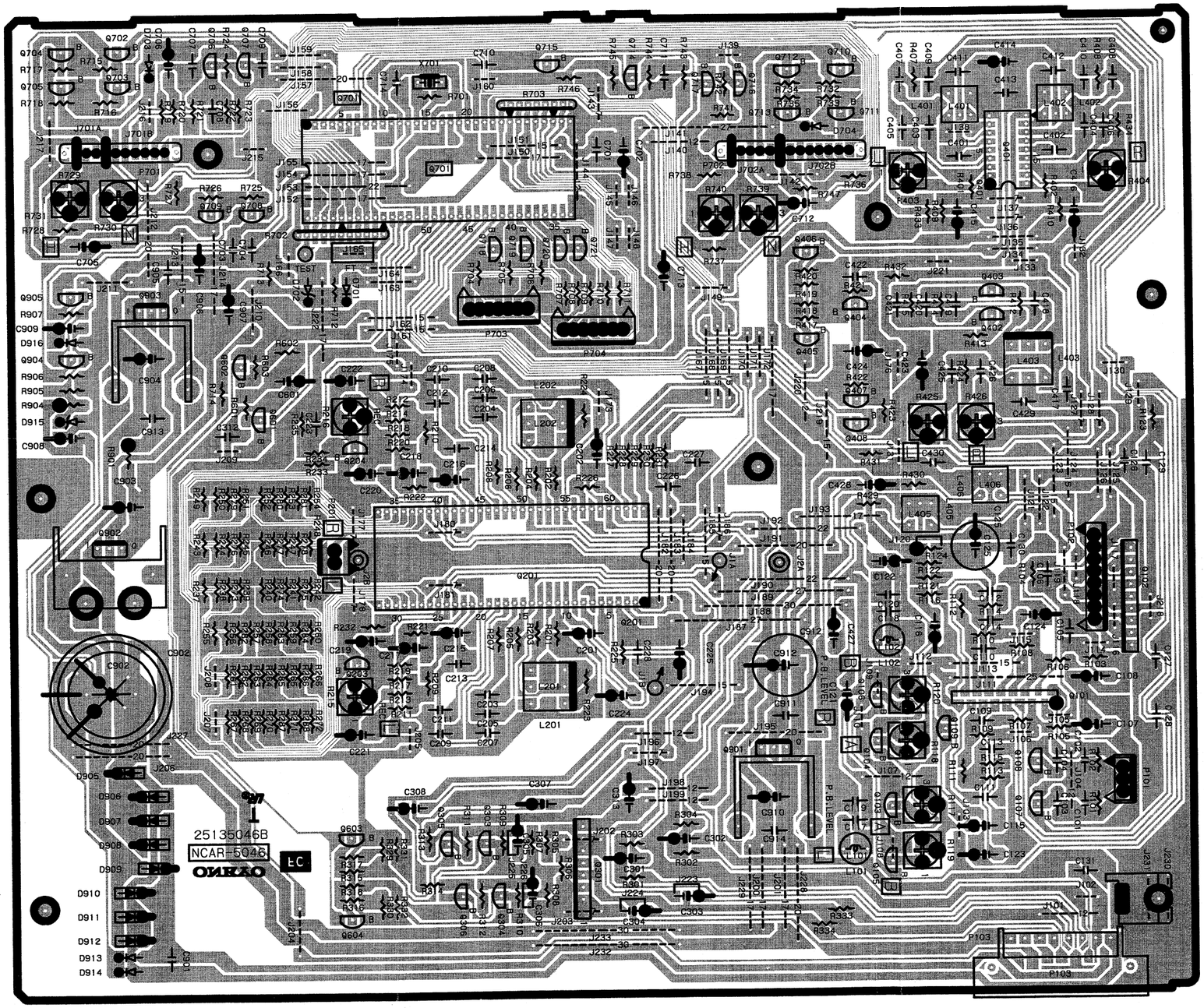
—MEMO—

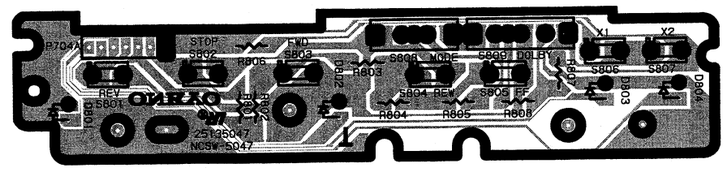
SCHEMATIC DIAGRAM

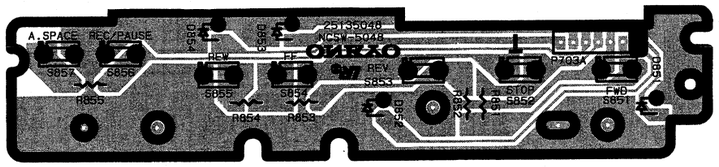


ONKYO CORPORATION

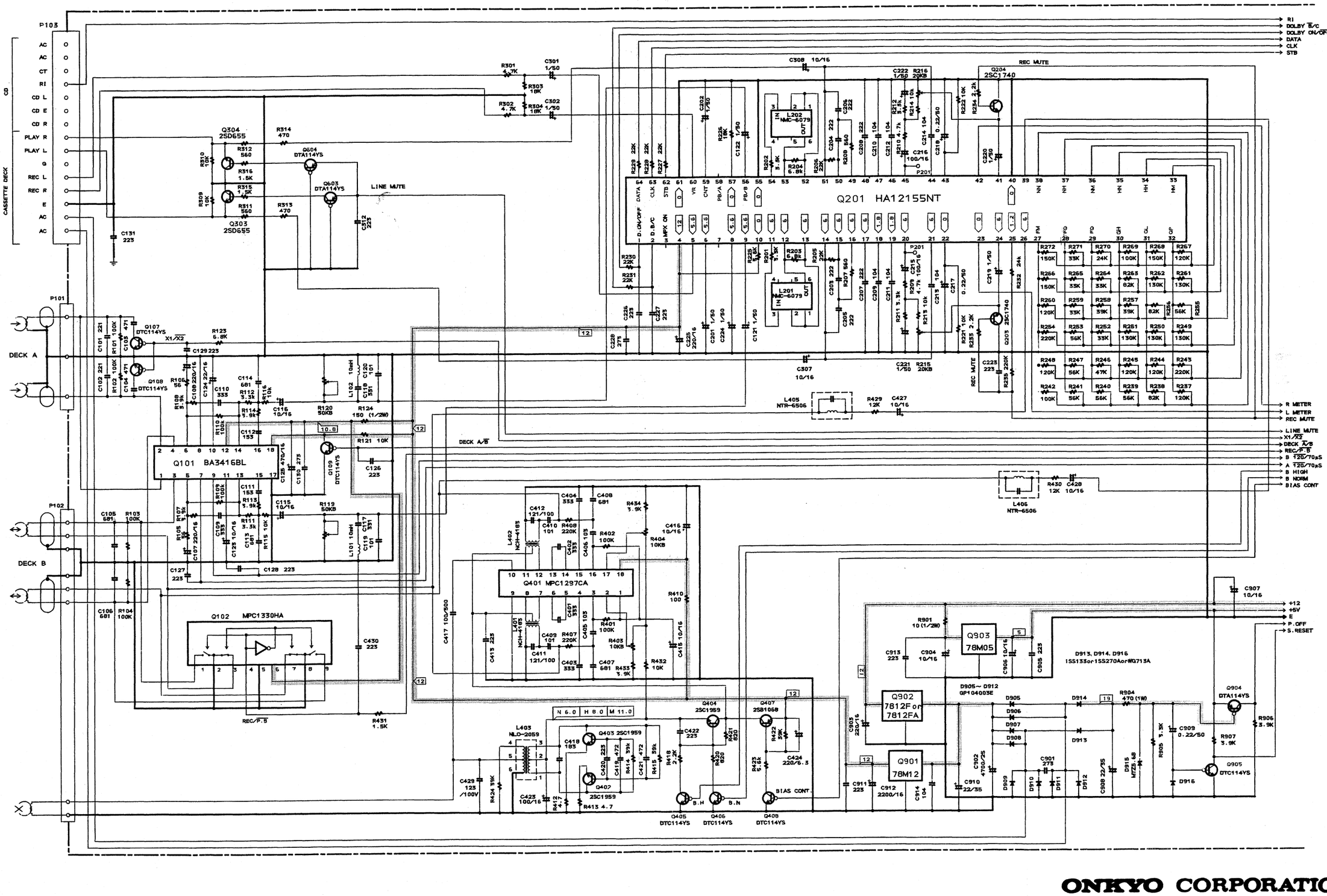
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE





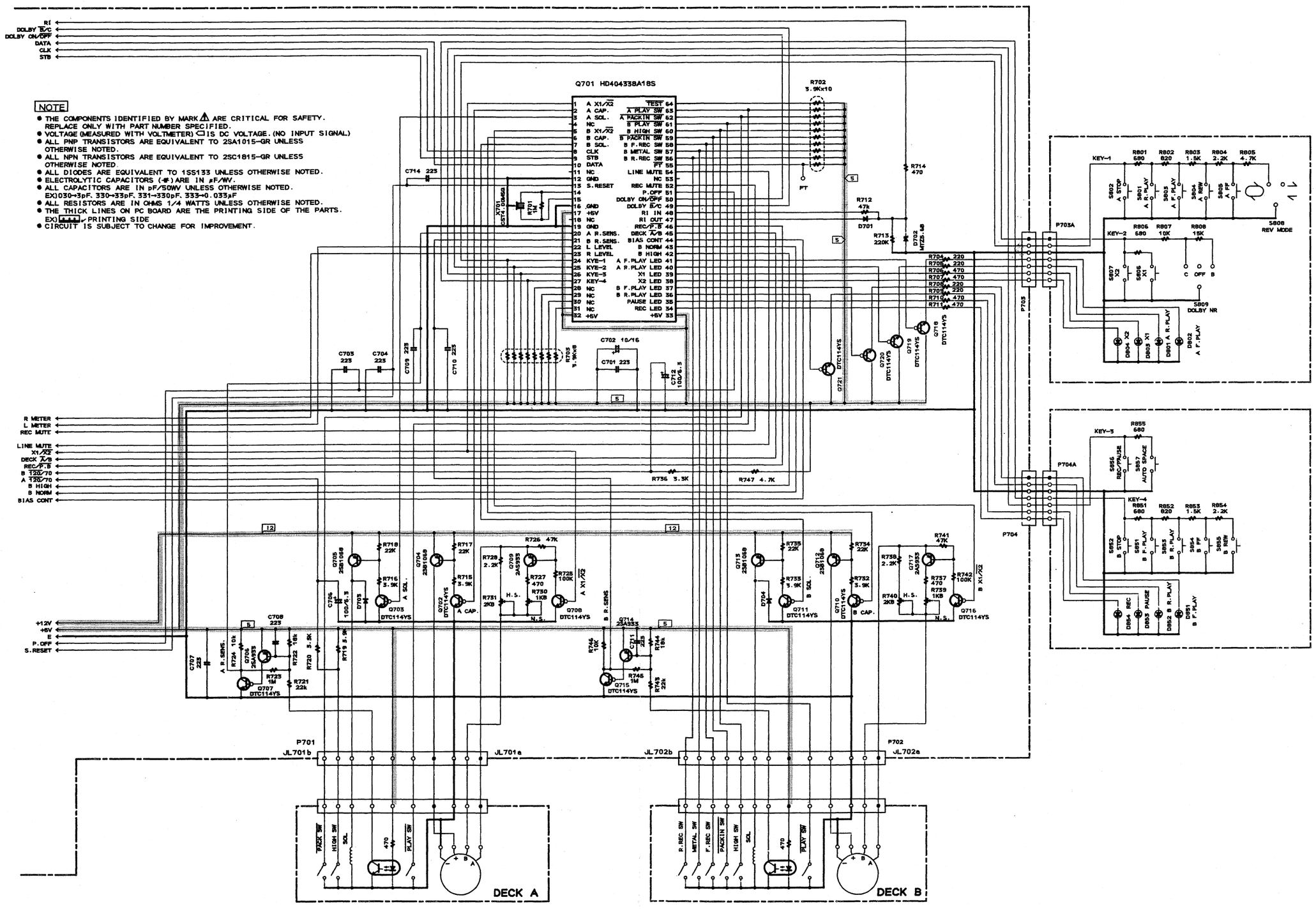


SCHEMATIC DIAGRAM

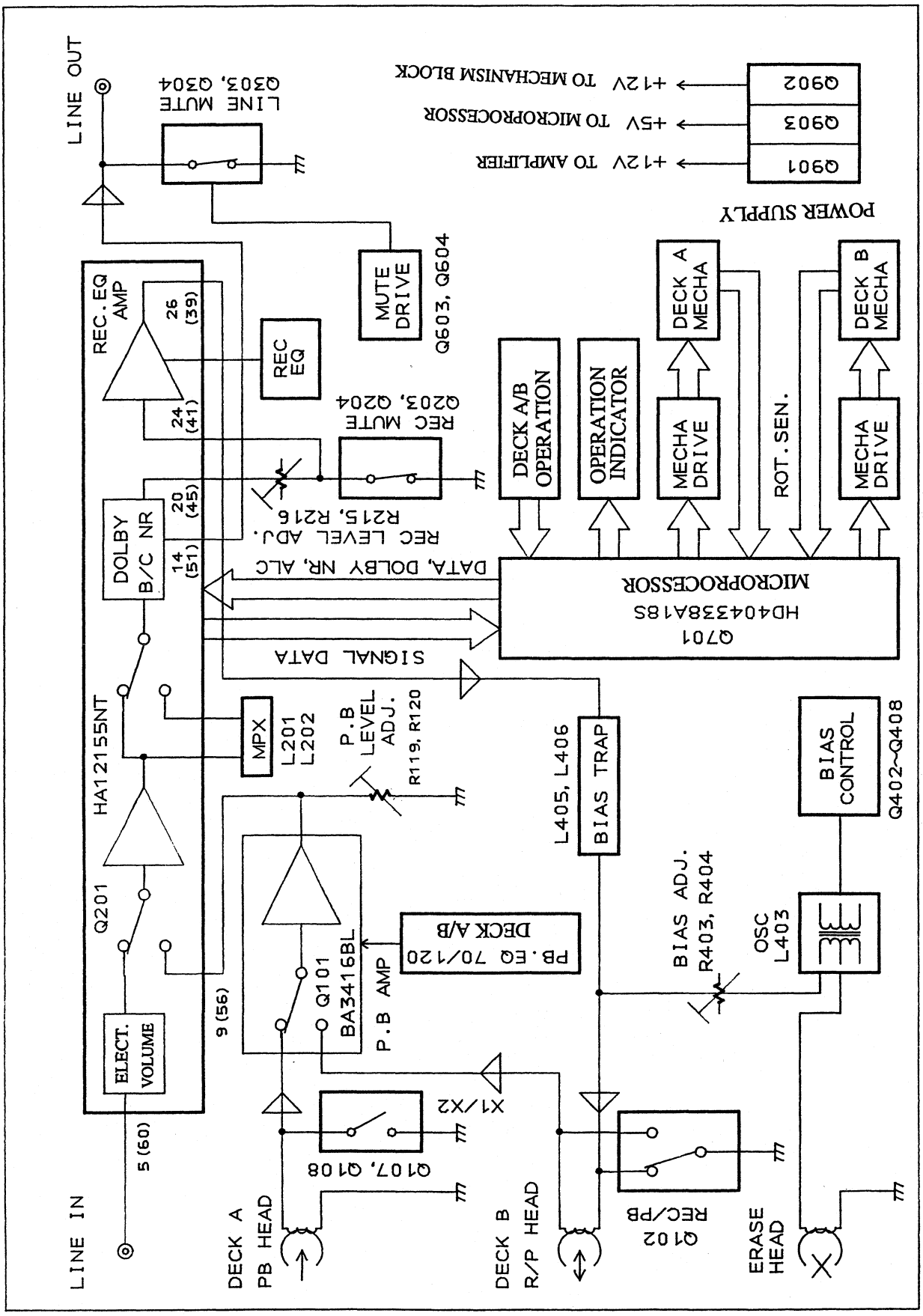


ONKYO CORPORATION

SCHEMATIC DIAGRAM



BLOCK DIAGRAM



ADJUSTMENT PROCEDURES

PRECAUTIONS

1. ***Before adjustment, clean the following parts with an alchol moistend swab.***
   - ***record/playback head** ***erase head***
   - ***pinch roller** ***capstan***
2. ***Do not use magnetized screwdriver for adjustments.***
3. ***Demagnetize record/playback head with a liead demagnetizer.***

TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator
Digital frequency counter
Oscilloscope
Attenuator
AC voltmeter
Non-magnetic screwdriver
Test tapes
TCC-153 ***:10kHz, −15dB***
MTT-111 ***:3kHz, −10dB***
MTT-150 ***:Dolby level calibration 400Hz, tone 200nWb/m***

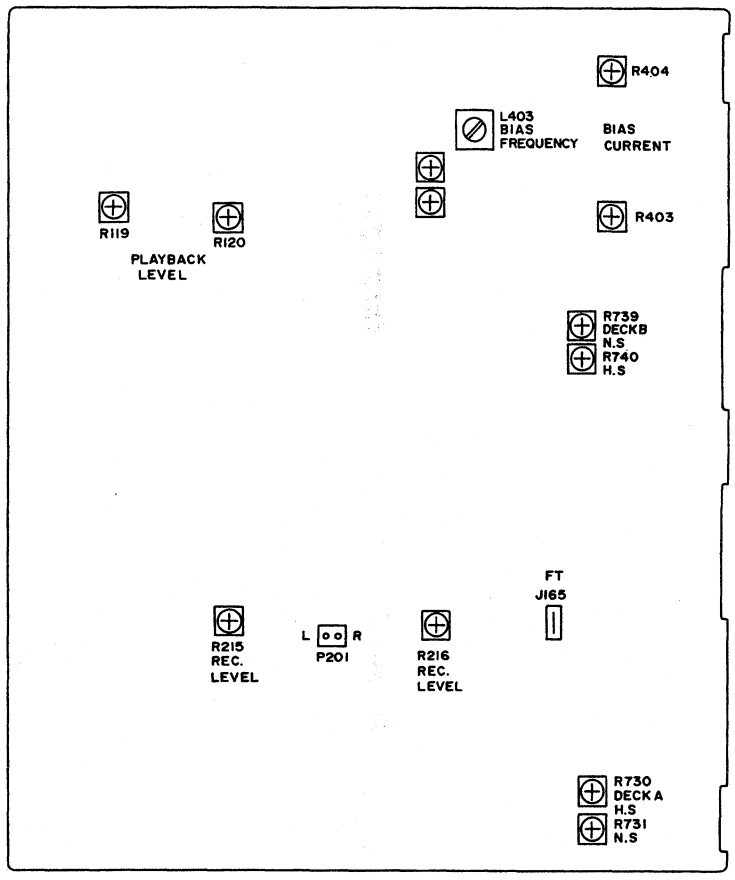
Tape speed adjustment

Connect the digital frequency counter to the line output terminal.
Load the test tape MTT-111 into the cassette holder.
Connect the test point J165 to the ground to be the unit to adjustment mode.
Press the forward play button. (The unit becomes the high speed.)
Adjust the trim resistors R731(Deck A) and R740(Deck B) so that the frequency counter reading becomes 6000Hz to 6020Hz.
Press the forward play button. (The unit becomes the normal speed.)
Adjust the trim resistors R730(Deck A) and R739(Deck B) so that the frequency counter reading becomes 3000Hz to 3010Hz.

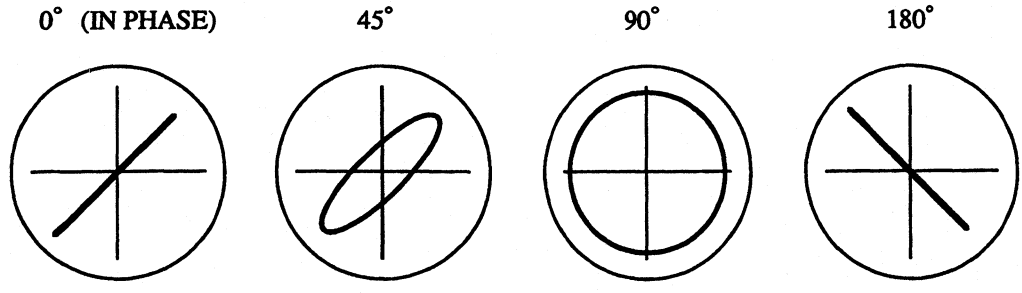
Item		Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remaks
1	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		TCC-153	PB	AC voltmeter Oscilloscope	Head azimuth acrew	Maximum and same phase at channels L and R	fig-1 fig-3
2	Playback level	AC voltmeter to terminals P201		MTT-150	PB	AC voltmeter	DECK B R119 (ch. L) R120 (ch. R)	300mV	
3	Bias frequency	Frequency counter to P102		METAL TAPE XS-C90	REC	Frequency counter	L403	85kHz±2kHz	
4	Bias current	fig-2	1kHz, −23dB and 12kHz, −23dB	UD-1 C-90	REC/PB	AC voltmeter	(K-32) R403 (ch. L) R404 (ch. R) (K-22) R425 (ch. L) R426 (ch. R)	Same level at 1kHz and 12kHz	Repeat the recording and play back until the 1kHz and 12kHz playback signals are same level.
5	Record level	fig-2	1kHz	UD-1 C-90	REC	AC voltmeter	Attenuator or AF OSC output	350mV	
					REC/PB	AC voltmeter	R215 (ch. L) R216 (ch. R)	Same level at REC/PB	

Blank tape NORMAL ·····UD-1 C-90
HIGH ·····XL-II C-90
METAL·····XS C-60

PLAY torque·····30~70g/cm
FF. REW torque·····80~180g/cm
Back tension ·····6~12g/cm



Adjustment point



Confirming phase relationship

Fig. 1

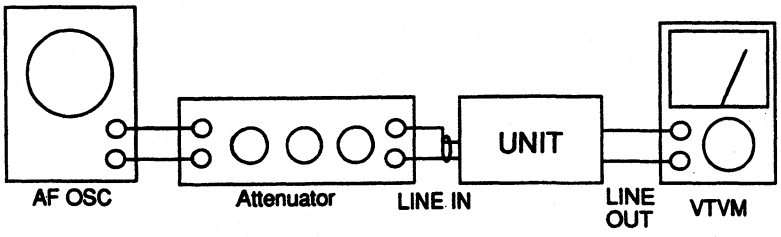


Fig. 2

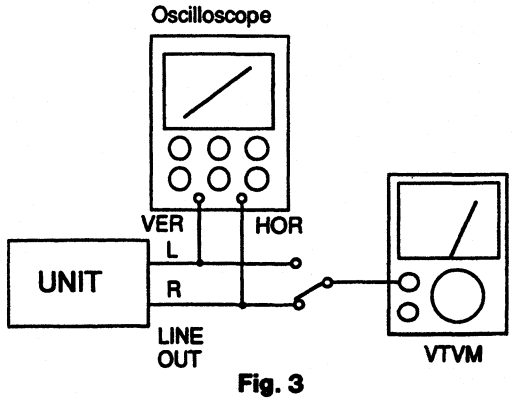
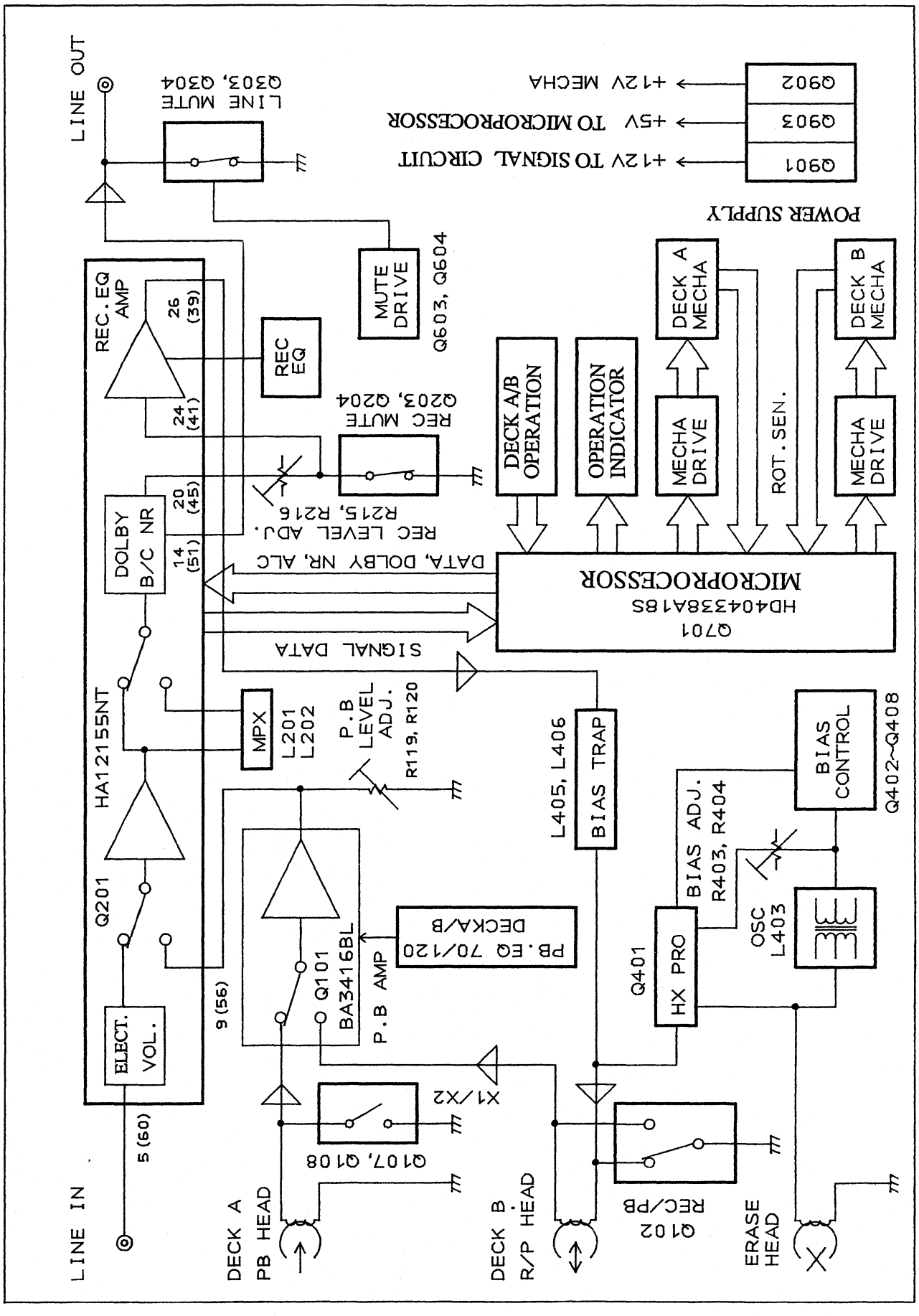
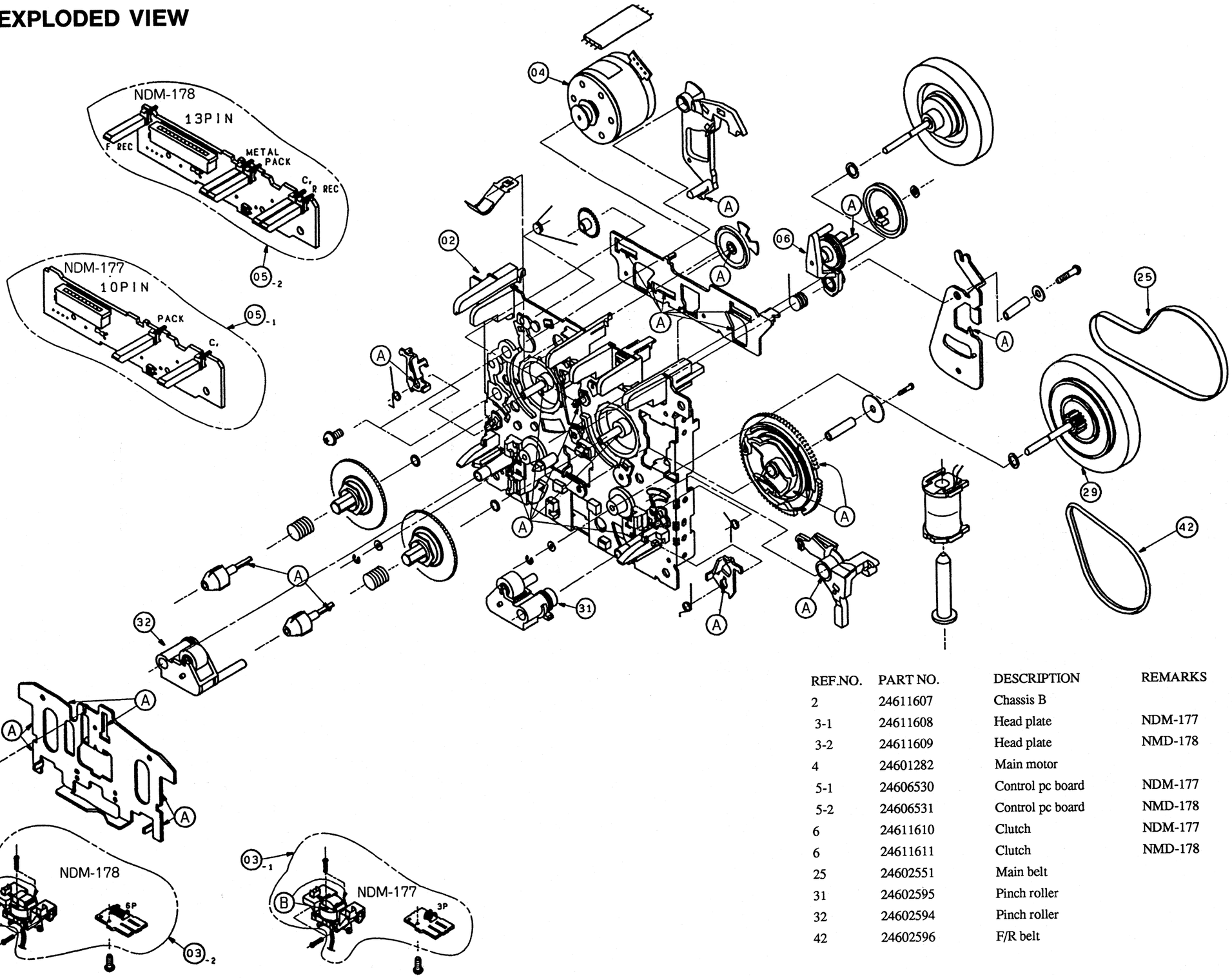


Fig. 3

BLOCK DIAGRAM

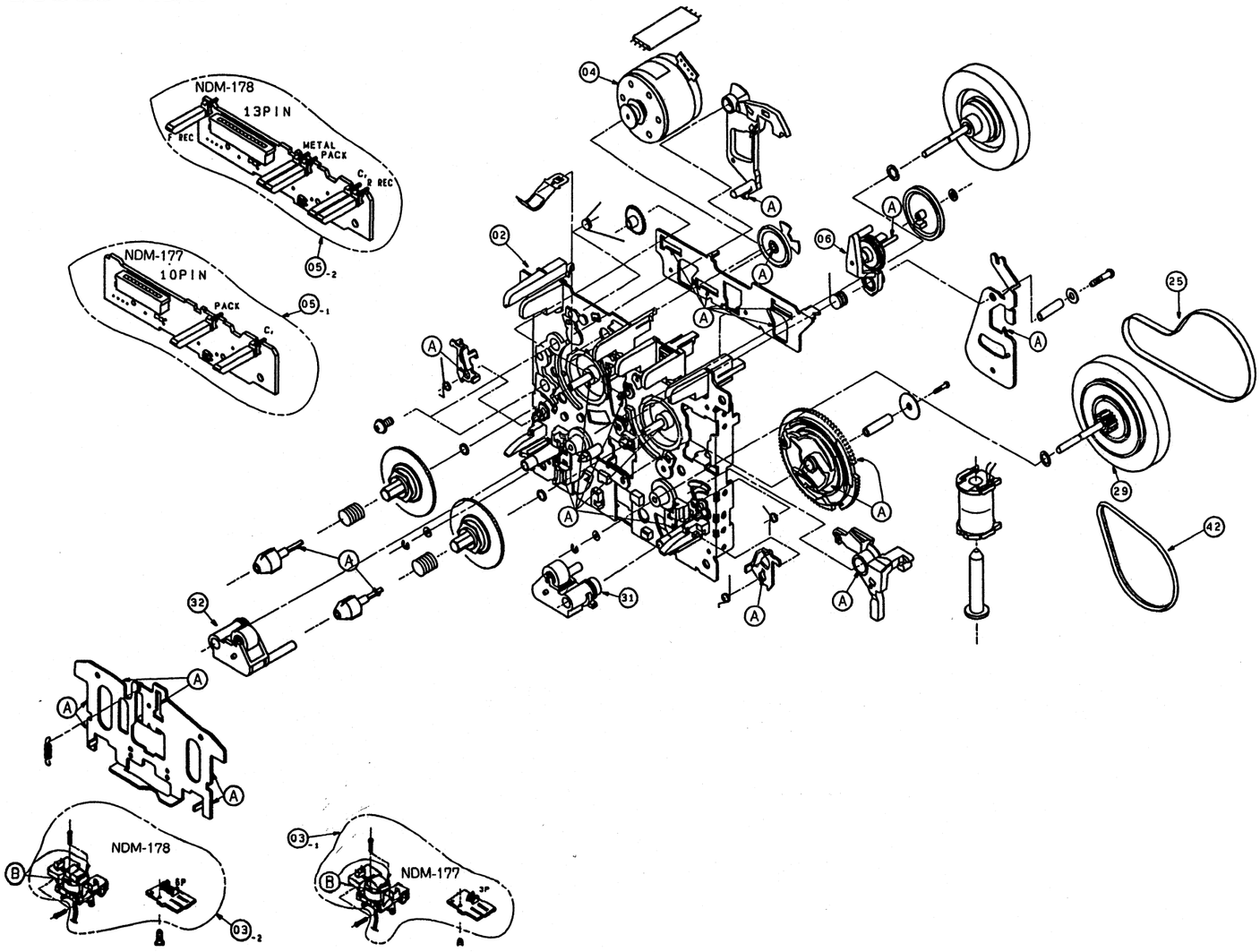


MECHANISM-EXPLODED VIEW



REF.NO.	PART NO.	DESCRIPTION	REMARKS
2	24611607	Chassis B	
3-1	24611608	Head plate	NDM-177
3-2	24611609	Head plate	NMD-178
4	24601282	Main motor	
5-1	24606530	Control pc board	NDM-177
5-2	24606531	Control pc board	NMD-178
6	24611610	Clutch	NDM-177
6	24611611	Clutch	NMD-178
25	24602551	Main belt	
31	24602595	Pinch roller	
32	24602594	Pinch roller	
42	24602596	F/R belt	

EXPLODED VIEW

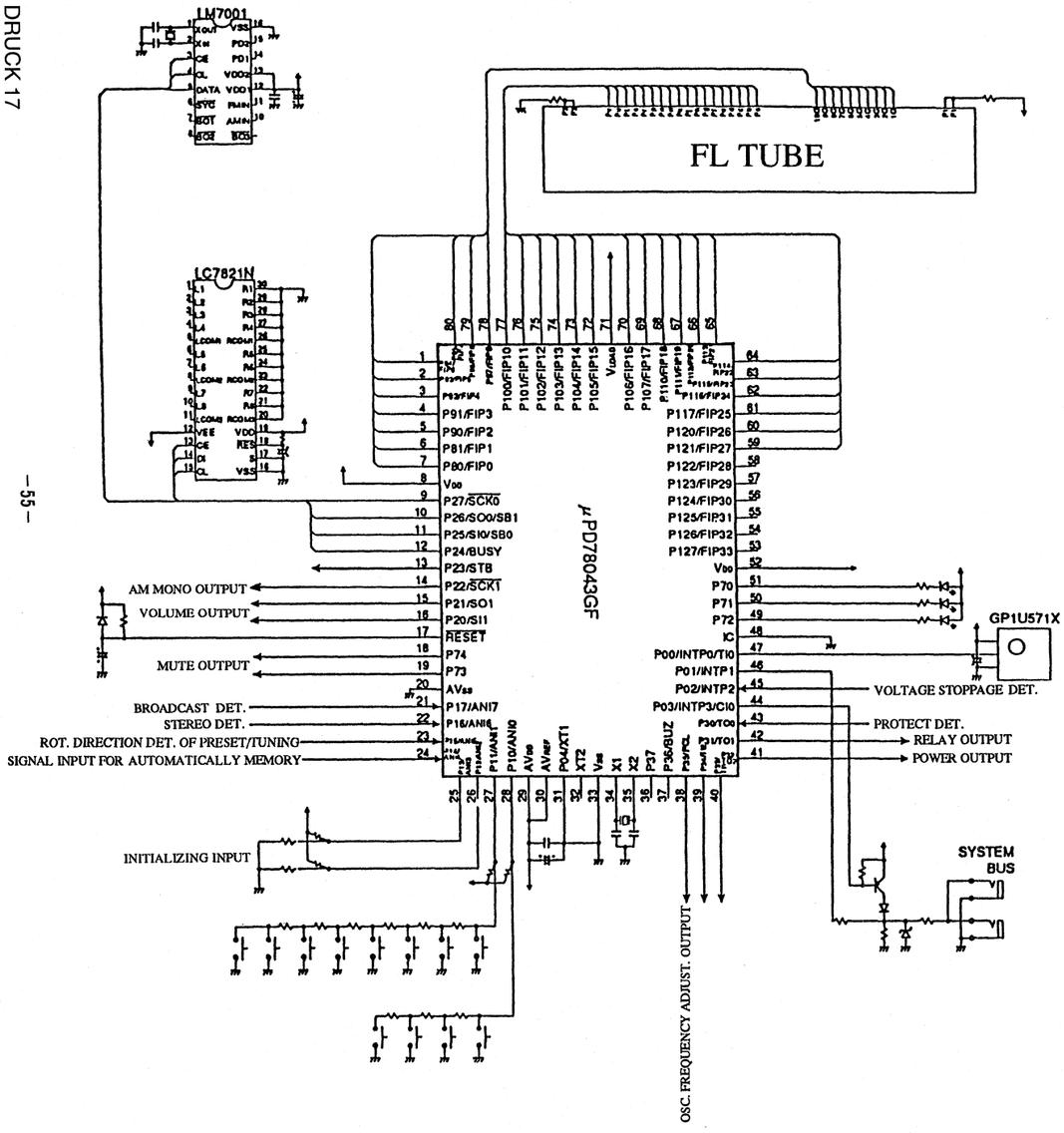


PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
1	27110804A	Front bracket <S>
	27110805A	Front bracket <B>
2	27262580	Plate
5	28400282	Damper
6	27180540	Spring B
7	27180541	Spring A
11	27130733B	Bracket F
14	28400463C	Cassette frame
15	27180272A	Spring
17	28324839-2Y	Knob EJA <S>
	28324839Y	Knob EJA <B>
18	28324840-2Y	Knob EJB <S>
	28324840Y	Knob EJB <B>
19	27141556AY	Bracket, eject
20	27301617BY	Spring,eject
21	28324975	Knob,Dolby <S>
	28324976	Knob,Dolby <B>
24	27100285	Chassis
27	27121890A	Rear panel <K-32>
	27121889A	Rear panel <K-22>
33	838430088	3TTB+8B(BC),Self-tapping screw
34	838130088	3TTB+8B,Self-tapping screw
35	838130108	3TTB+10B,Self-tapping screw
40	27190524	KGLS-14RF,Holder
41	28184567-1	Top cover <S>
	28184566A	Top cover <B>
42	834230108	3TTS+10B(Ni),Self-tapping screw <S>
	838430088	3TTB+8B(BC),Self-tapping screw <B>
43	27211614	Front panel <S>
	27211615	Front panel <B>
44	28198803	Facet A
45	28198804	Facet B
46	27301830A	Cassette lid A <S> <K-32>
	27301828	Cassette lid A <S> <K-22>
	27301831	Cassette lid A <B> <K-32>
	27301829	Cassette lid A <B> <K-22>
47	27301823A	Cassette lid B <S> <K-32>
	27301820A	Cassette lid B <S> <K-22>
	27301825	Cassette lid B <B> <K-32>
	27301827	Cassette lid B <B> <K-22>
48	27301818A	Cassette lid BSA <S>
	27301819	Cassette lid BSA <B>
49	27301820A	Cassette lid BSB <S>
	27301821	Cassette lid BSB <B>
50	28191681A	Clear plate
51	260208	Wire tie
53	28140860	Cushion
55	27175299A	Leg
JL101	2009990325	NSAS-6P0461,Socket
JL102	2009990326	NSAS-14P0462,Socket
U1	1N193546-1	NAAR-5046-1,Main circuit pc board ass'y <K-32>
	1N194546-2	NAAR-5046-2,Main circuit pc board ass'y <K-22>
U2	1N193547-1	NASW-5047-1,Operation switch pc board ass'y
U3	1N193548-1	NASW-5048-1,Operation switch pc board ass'y
Z1	244186	NDM-177,Deck mechanism
Z2	244187	NDM-178,Deck mechanism
Z3	24611605	Eject ass'y L
Z4	24611606	Eject ass'y R
Z5	833126047	2.6TTP+4S,Self-tapping screw

[B]: Black model only
[S]: Silver model only

MICROPROCESSOR-CONNECTION VIEW



PIN NO.	15	16
OPERATION	VOLUP	VOLDOWN
STOP	H	H
VOLUME UP	H	L
VOLUME DOWN	L	H
POWER OFF	L	L

Table 1

BAND1	BAND0	Region	Frequency range	Channel space
0	1	Europe	87.50～108.00MHz	50 kHz
1	0	Saudi Arabia	87.50～108.00MHz	50 kHz
1	1	U.S.A	87.9～107.90MHz	200 kHz

AM	Region	Frequency range	Channel space
0	Europe	522～1611 kHz	9 kHz
0	Saudi Arabia	531～1602 kHz	50 kHz
1	U.S.A	530～1710 kHz	200 kHz

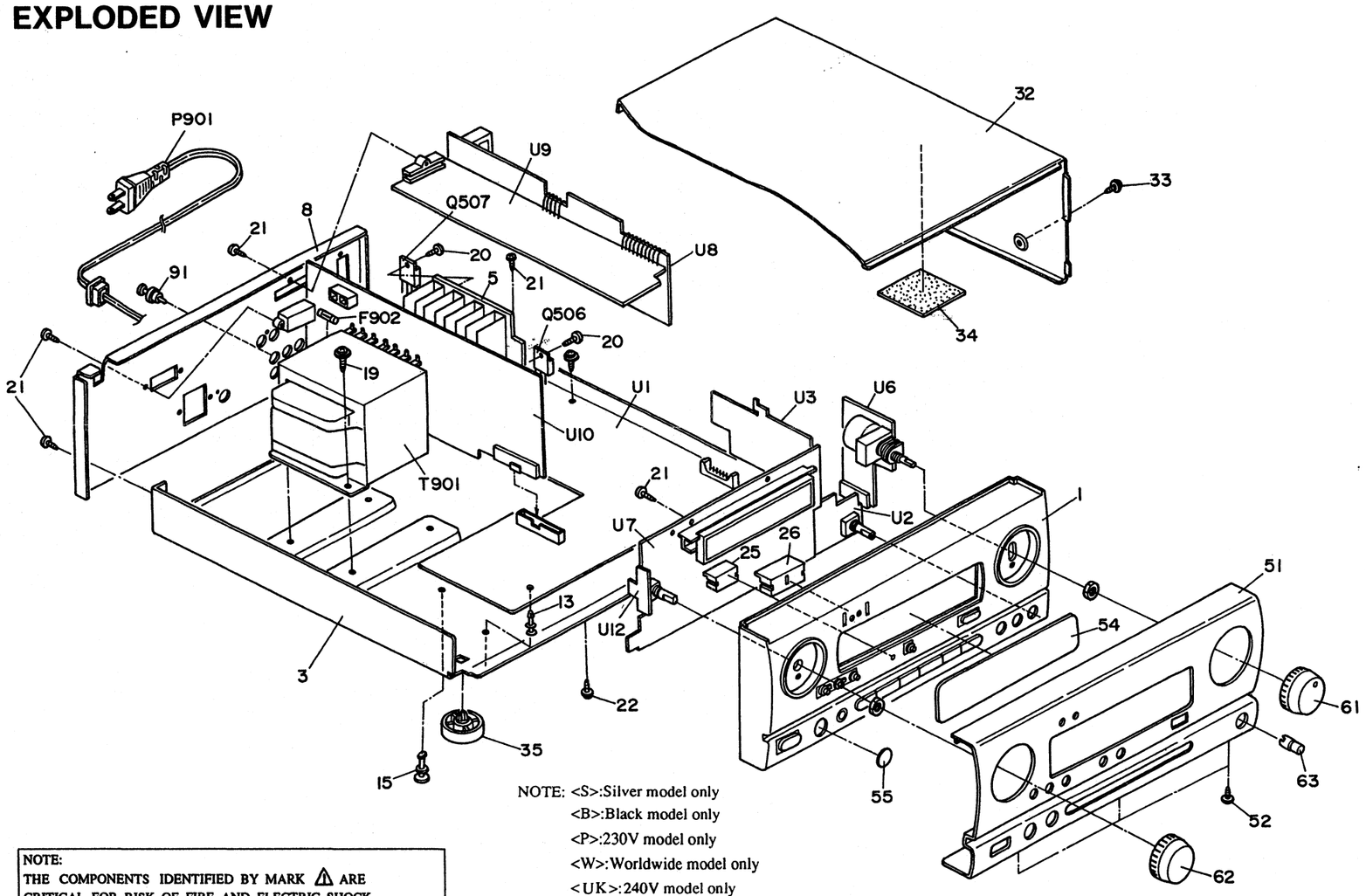
Table 2

TERMINAL DESCRIPTION

Pin No.	Function	I/O	Description
1～7	7G～1G	O	Grid output terminal. On at the high level.
8	VDD		Positive power source terminal (+5V)
9	CL	O	Clock output terminal. Connect to the terminal CL of selector switch LC7821N and the terminal CL of PLL IC LM 7001.
10	DATA	O	Data output terminal. Connect to the terminal DI of selector switch LC7821N and the terminal DI of PLL IC LM7001.
11	FCE	O	Chip enable output terminal. Connect to the terminal CE of selector switch LC7821N.
12	PLLCE	O	Chip enable output terminal. Connect to the terminal CE of PLL IC LM7001.
13	AMEMORY	O	Control output terminal for automatically memory.
14	AM MONO	O	AM AUTO/MONO control terminal. Not used.
15	VOLUP	O	VOLUME UP/DOWN control output terminals.
16	VOLDOWN	O	Refer to the table 1.
17	$\overline{\text{RESET}}$	I	System reset terminal. Low level when reset.
18	TUMUT	O	Muting control signal output terminal for tuner section.
19	INPMUT	O	Muting control signal output terminal for amplifier section.
20	AVSS		Ground terminal for A/D converter.
21	$\overline{\text{SD}}$	I	Broadcast detection input terminal.
22	$\overline{\text{STEREO}}$	I	Stereo broadcast detection input terminal.
23	K2	I	PRESET/TUNING input terminal
24	AMEMORY	I	Signal input terminal for automatically memory
25	AREA	I	Initializing input terminal for the band area
26	MODE	I	Initializing input terminal for operation mode
27	K1	I	Operation key input terminals.
28	K0	I	
29	AVDD		Power source terminal for A/D converter. +5V
30	AVREF		Reference voltage input terminal for A/D converter. +5V
31	XT1		Resonator connection terminal for sub system.
32	XT2		Not used.

Pin No.	Function	I/O	Description
33	VSS		Ground terminal
34	X1		Resonator connection terminal for main system.
35	X2		Connect the 4.19 MHz ceramic resonator.
36,37	NC		Not used.
38	FOUT	O	Output terminal for adjustment of oscillator frequency.
39	VIDEO-2V	O	Video signal selector terminal.
40	DIVEO-1V	O	Not used.
41	POWER	O	Control terminal for AC outlet relay.
42	RELAY	O	Control terminal for speaker relay.
43	PROTECT	I	Detection input terminal for the protection circuit
44	$\overline{\text{SYSOUT}}$	O	System code output terminal
45	$\overline{\text{POFF}}$	I	Detection input for the power stoppage
46	SYSIN	I	System code input terminal
47	$\overline{\text{REMIN}}$	I	Remote control signal input terminal
48	IC		Internal connection terminal
49	$\overline{\text{PRESET}}$	O	PRESET LED control output
50	$\overline{\text{TUNING}}$	O	TUNING LED control output
51	$\overline{\text{LOUDNESS}}$	O	LOUDNESS LED control output
52	VDD		Positive power source terminal (+5V)
53～58	NC		Not used.
59～70	P16～P5	O	Segment output terminal
71	VLOAD		Pull-down resistor connection terminal for FL tube controller
72～75	P4～P1	O	Segment output terminals
76～80	12G～8G	O	Grid output terminals

EXPLODED VIEW



NOTE: <S>:Silver model only
<B>:Black model only
<P>:230V model only
<W>:Worldwide model only
<UK>:240V model only

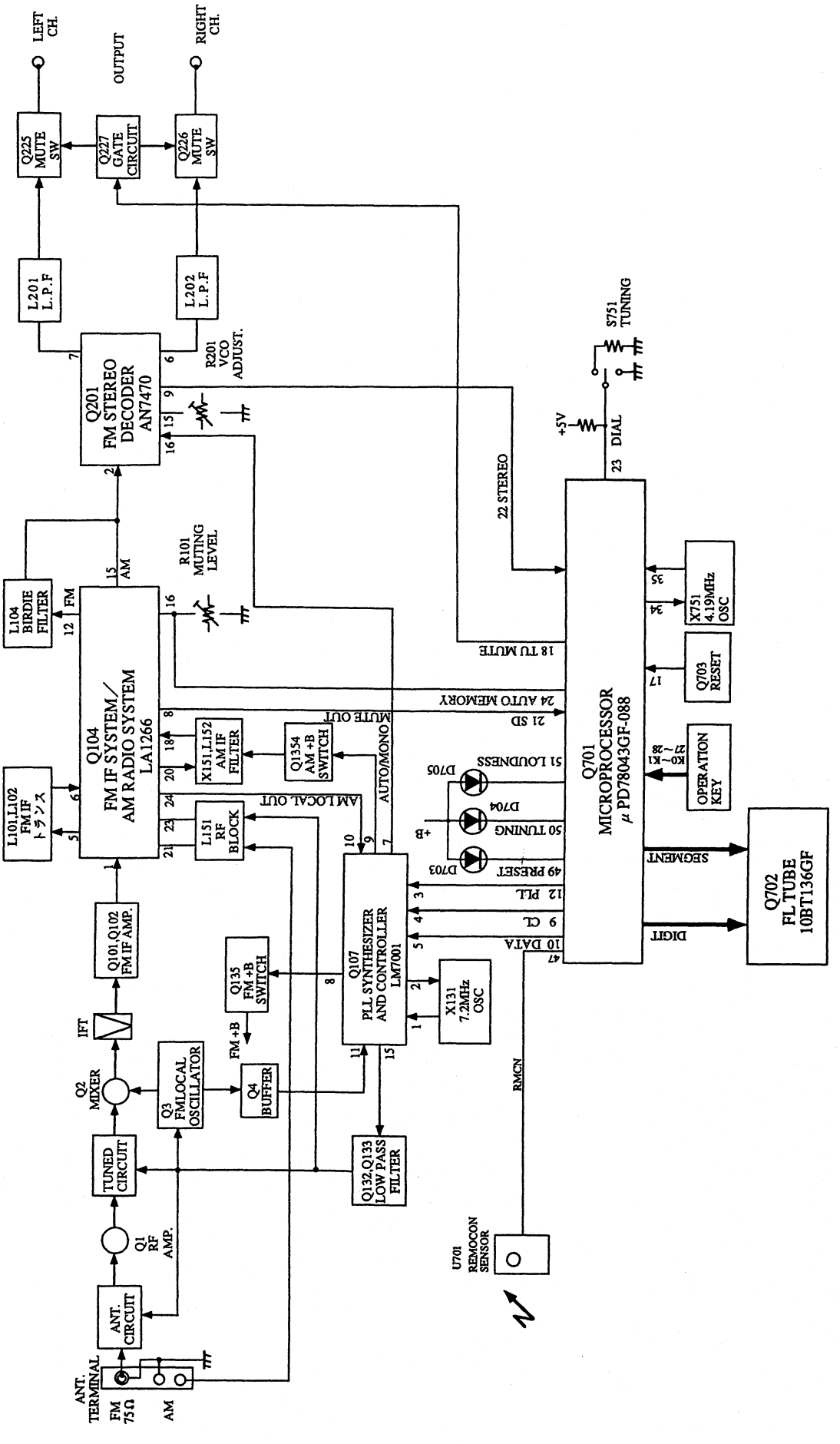
NOTE:
THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

PARTS LIST

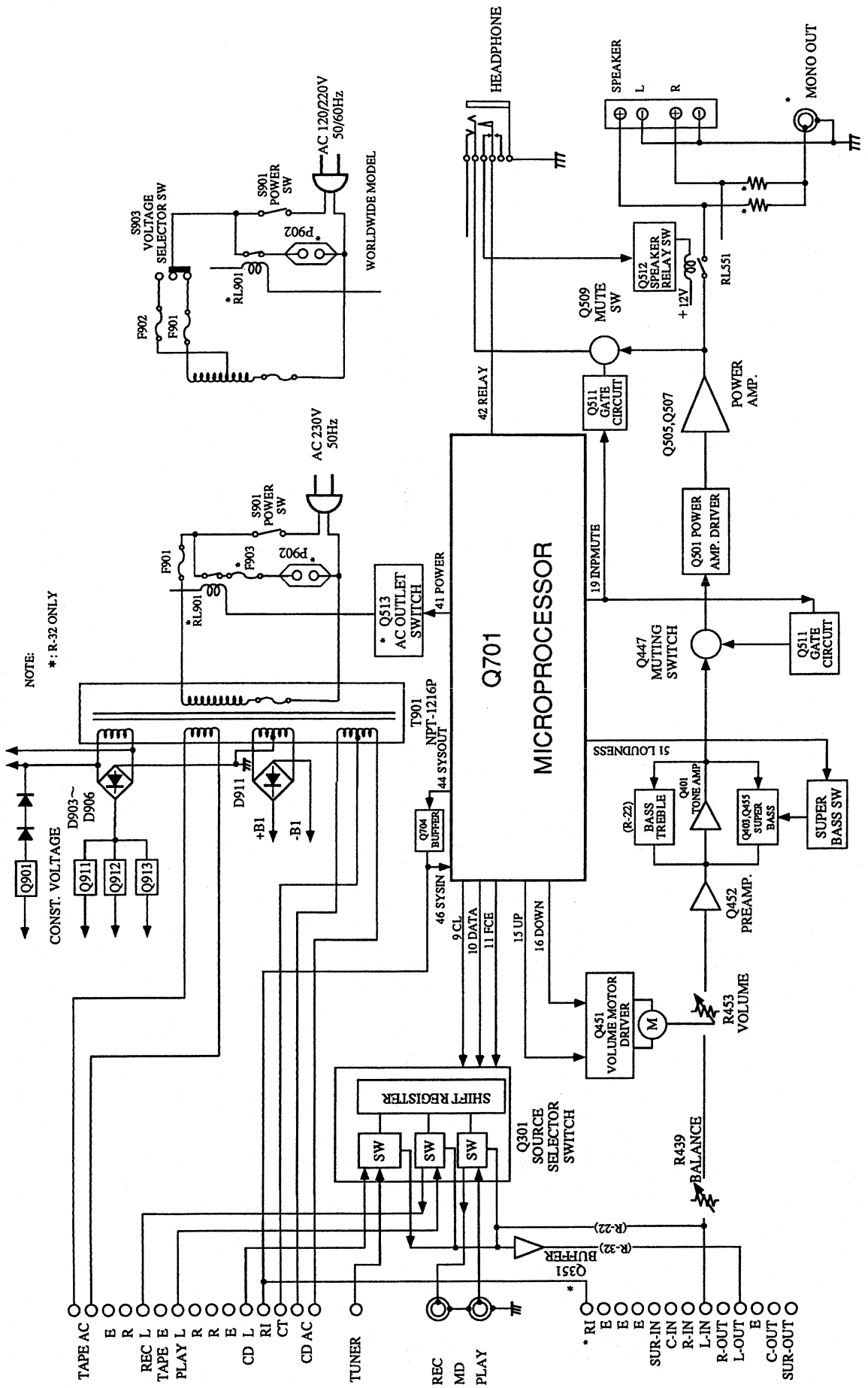
REF.NO.	PART NO.	Model	DESCRIPTION
1	27110809		Front bracket <S>
	27110810		Front bracket <B>
3	27100287		Chassis
5	27160338A		Radiator
8	27121900B	R-32	Rear panel <P>
	27121901B	R-32	Rear panel <W>
	27121903B	R-22	Rear panel <P>
	27121904B	R-22	Rear panel <W>
13	27190524		KGLS-14RF,Holder
15	27190802		KGPS-14R,Holder
19	830440089		4TTC+8C(BC),Self-tapping screw
20	801433		3SMS8W SW+14SW+14B(BC),Sems screw
21	838130088		3TTB+8B,Self-tapping screw
22	831130088		3TTW+8B,Self-tapping screw
25	28198805		Facet
26	28198806		Facet
32	28184565-1		Top cover <S>
	28184564A		Top cover <B>
33	834230108		3TTS+10B(Ni),Nickel screw <S>
	838430088		3TTB+8B(BC),Self-tapping screw <B>
34	28140555-1		t3×36×10,Cushion
35	27175299A		Leg
51	27211616	R-32	Front panel <S>
	27211617	R-32	Front panel <B>
	27211618	R-22	Front panel <S>
	27211619	R-22	Front panel <B>
52	838130088		3TTB+8B,Self-tapping screw
54	28191683		Clear plate
55	28191684		Clear plate
61	28324981		Knob VOLUME <S>
	28324982		Knob VOLUME <B>
62	28324983		Knob TUNING <S>
	28324984		Knob TUNING <B>
63	28324985		Knob BALANCE <S>
	28324986		Knob BALANCE <B>
91	250153		P-0107,Plug
F901	252071	⚠	1.25A-SE-EAK,Primary fuse
F902	252075	⚠	2.5A-SE-EAK,Primary fuse <W>
F903	252071	⚠ R-32	1.25A-SE-EAK,AC outlet fuse <P>

REF.NO.	PART NO.	Model	DESCRIPTION
P901	253207AHIT ⚠		AS-CEE,Power supply cord
	253209AHIT ⚠		AS-BS,Power supply cord <UK>
Q505,Q506	2202303,		2SC4512-O,
	2202304 or		2SC4512-Y or
	2202305		2SC4512-P,Power transistors
Q507,Q508	2202313,		2SA1726-O,
	2202314 or		2SA1726-Y or
	2202315		2SA1726-P,Power transistors
T901	2301038A ⚠		NPT-1216P,Power transformer <P>
	2301039A ⚠		NPT-1216DG,Power transformer <W>
U1	1A518514-1	R-32	NAAF-5014-1,Main circuit pc board ass'y <P>
	1A518514-1A	R-32	NAAF-5014-1A,Main circuit pc board ass'y <W>
	1A522514-2	R-22	NAAF-5014-2,Main circuit pc board ass'y <P>
	1A522514-2A	R-22	NAAF-5014-2A,Main circuit pc board ass'y <W>
U2	1A518515-1	R-32	NAETC-5015-1, Balance volume pc board ass'y
	1A522515-2	R-22	NAETC-5015-2, Balance volume pc board ass'y
U3	1A518516-1	R-32	NAAF-5016-1,Tone circuit pc board ass'y
	1A522516-2	R-22	NAAF-5016-2,Tone circuit pc board ass'y
U5	1A518518-1	R-32	NAETC-5018-1,Master volume pc board ass'y
	1A522518-2	R-22	NAETC-5018-2,Master volume pc board ass'y
U7	1A518520-1	R-32	NADG-5020-1,FL tube pc board ass'y <P>
	1A518520-1A	R-32	NADG-5020-1A,FL tube pc board ass'y <W>
	1A522520-2	R-22	NADG-5020-2,FL tube pc board ass'y <P>
	1A522520-2A	R-22	NADG-5020-2A,FL tube pc board ass'y <W>
U8	1A518521-1	R-32	NARF-5021-1,Tuner circuit pc board ass'y
	1A522521-2	R-22	NARF-5021-2,Tuner circuit pc board ass'y
U9	1A518522-1	R-32	NAAF-5022-1,Stereo decoder pc board ass'y <P>
	1A518522-1A	R-32	NAAF-5022-1A,Stereo decoder pc board ass'y <W>
	1A522522-2	R-22	NAAF-5022-2,Stereo decoder pc board ass'y <P>
	1A522522-2A	R-22	NAAF-5022-2A,Stereo decoder pc board ass'y <W>
U10	1A518523-1	R-32	NAPS-5023-1,Power source pc board ass'y <P>
	1A518523-1A	R-32	NAPS-5023-1A,Power source pc board ass'y <W>
	1A522523-2	R-22	NAPS-5023-2,Power source pc board ass'y <P>
	1A522523-2A	R-22	NAPS-5023-2A,Power source pc board ass'y <W>
U11	1A518524-1	R-32	NASW-5024-1,Voltage selector switch pc board ass'y <W>
	1A522524-2	R-22	NASW-5024-2,Voltage selector switch pc board ass'y <W>
U12	1A518533-1	R-32	NASW-5033-1,Tuning switch pc board ass'y
	1A522533-2	R-22	NASW-5033-2,Tuning switch pc board ass'y

BLOCK DIAGRAM
TUNER SECTION

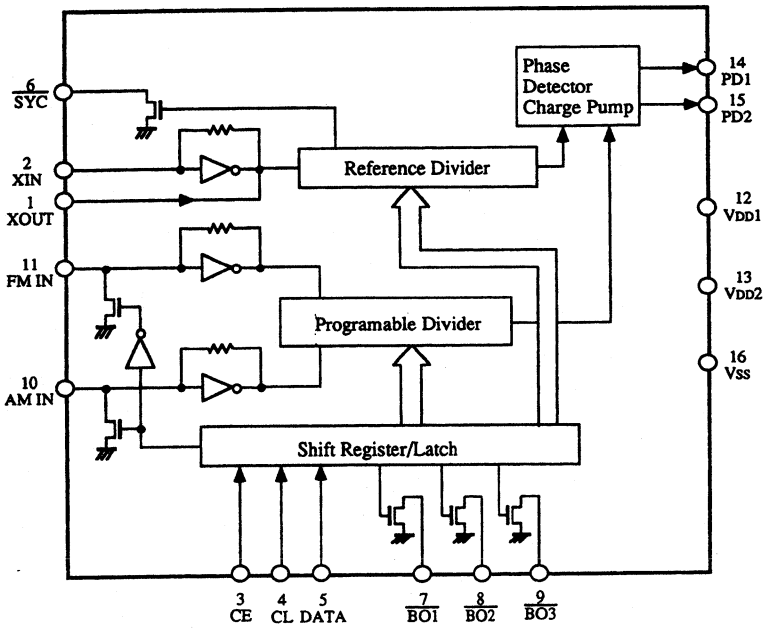


BLOCK DIAGRAM
AMPLIFIER SECTION



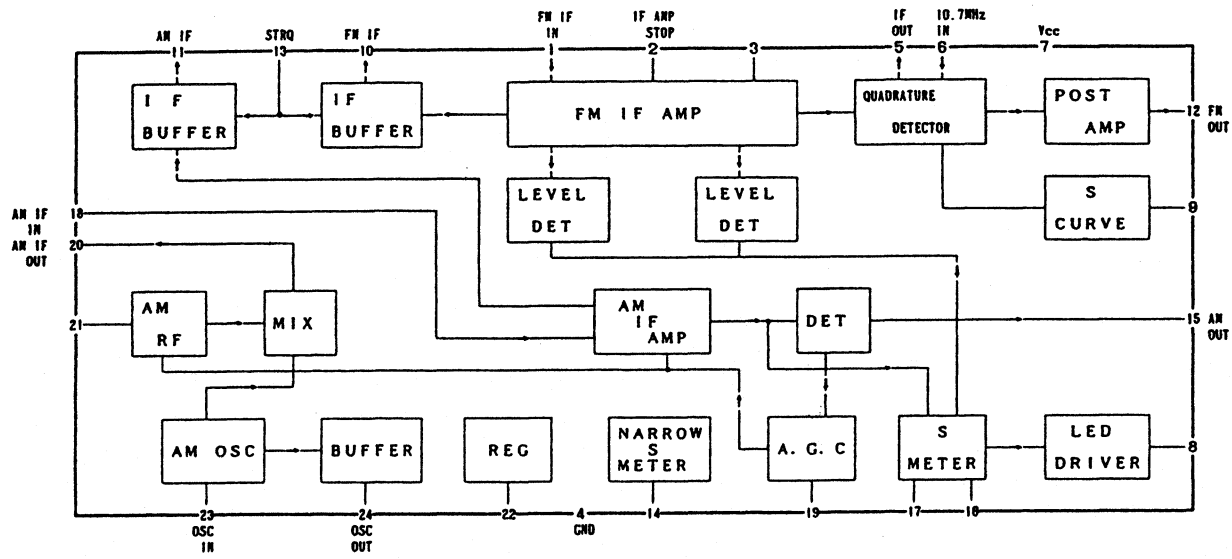
IC BLOCK DIAGRAMS AND DESCRIPTION

LM7001 (PLL Synthesizer and Controller)

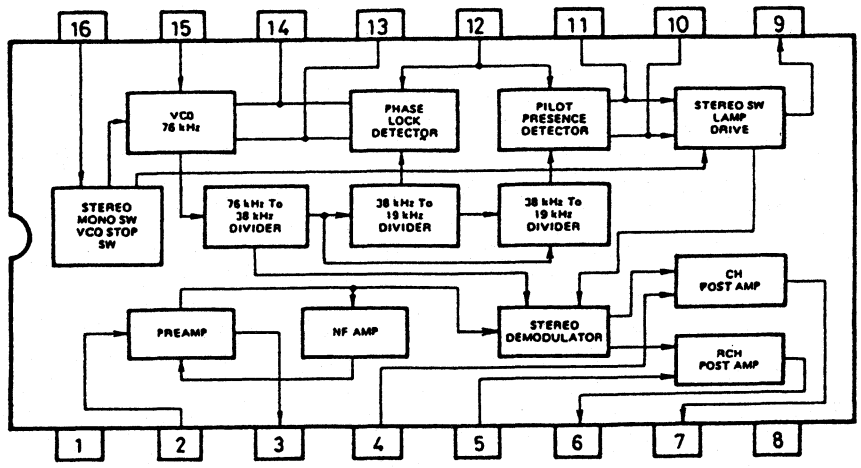


Pin No.	Terminal	Description
1	XOUT	Connect the 7.2MHz crystal resonator.
2	XIN	
3	CE	Chip enable terminal. Connect to the terminal PLL of the microprocessor.
4	CL	Serial clock input terminal. Connect to the terminal ACL of the microprocessor.
5	DATA	Serial data input terminal. Connect to the terminal ADA of the microprocessor.
6	$\overline{SYN}$	Not used.
7	$\overline{AUTO}$/MONO	AUTO/MONO selection terminal. Auto at the low level.
8	$\overline{FM}$	FM selection terminal. FM at the low level.
9	$\overline{AM}$	AM selection terminal. AM at the low level.
10	AMIN	AM local oscillator signal input terminal
11	FMIN	FM local oscillator signal input terminal
12	VDD1	Power supply terminal for back-up.
13	VDD2	Power suply terminal
14	PD1	Charge pump output terminal
15	PD2	Charge pump output terminal
16	Vss	Ground terminal

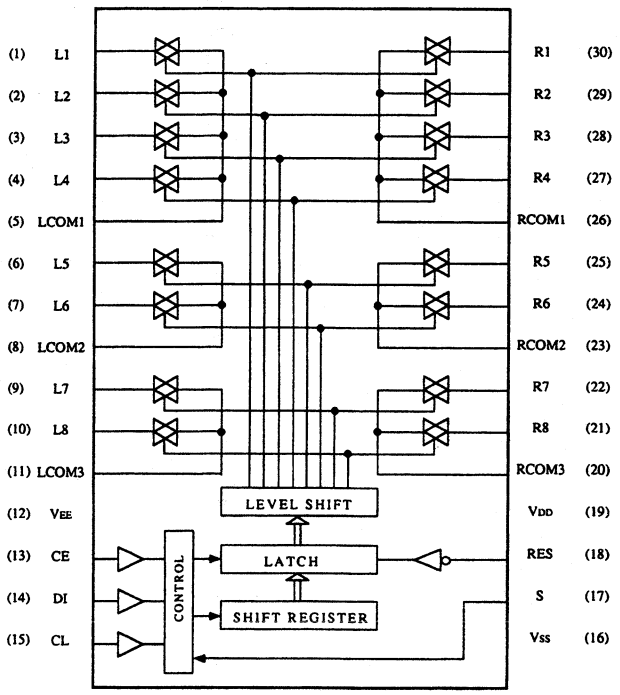
LA1266 (FM IF and AM Radio System)



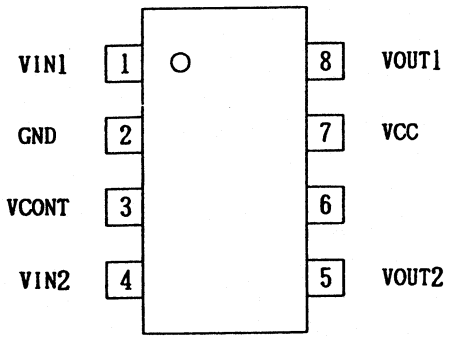
AN7470 (FM Stereo Decoder)



LC7821N (Analogue Switch)

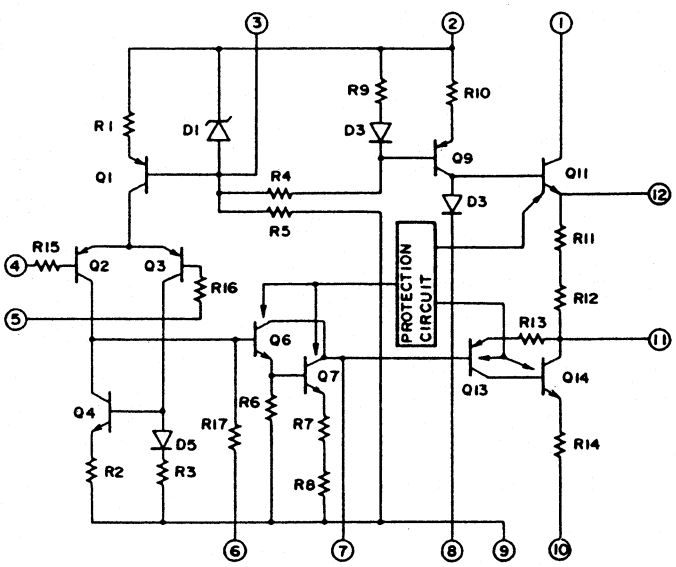


LB1639 (Volume Motor Drive)

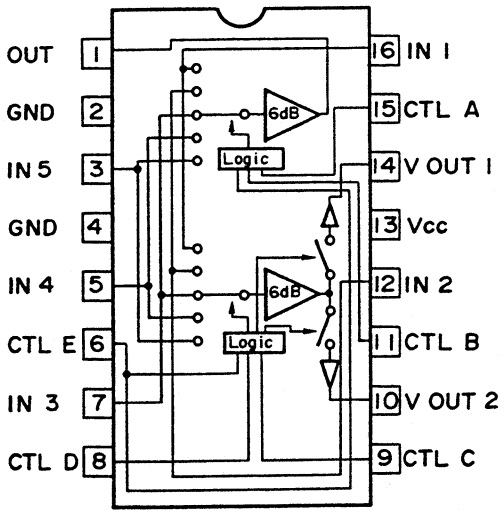


VIN1	VIN2	VOUT1	VOUT2	
H	L	H	L	CD
L	H	L	H	CCD
H	H	OFF	OFF	STOP
L	L	OFF	OFF	STOP

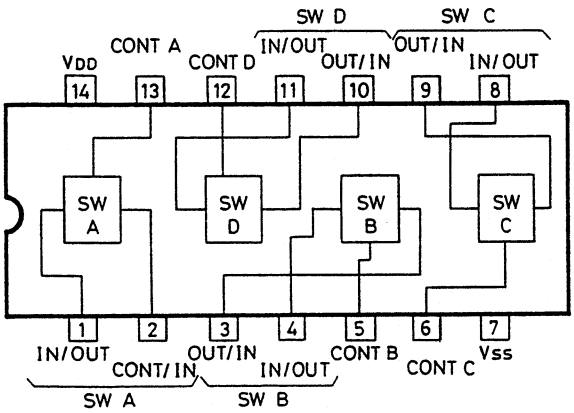
μPC1225H (Power Amplifier Driver)



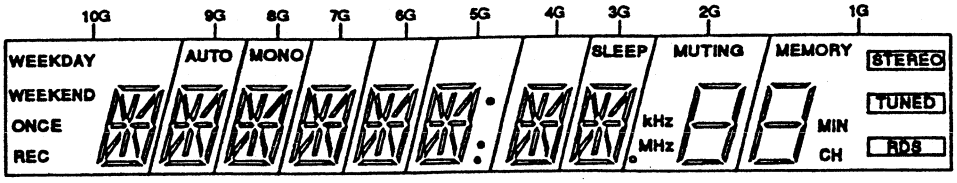
BA7625 (Video Selector Switch)

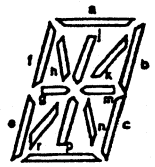


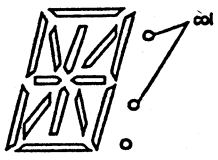
LC4966

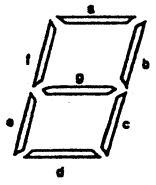


10BT-136GK (FL Tube)









	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	a	a	a	a	a	a	a	a	a	a
P2	b	b	b	b	b	b	b	b	b	b
P3	c	c	c	c	c	c	c	c	c	c
P4	d	d	d	d	d	d	d	d	d	d
P5	e	e	e	e	e	e	e	e	e	e
P6	f	f	f	f	f	f	f	f	f	f
P7	g	g	g	g	g	g	g	g	g	g
P8	h	h	h	h	h	h	h	h	-	-
P9	j	j	j	j	j	j	j	j	MUTING	MEMORY
P10	k	k	k	k	k	k	k	k	-	STEREO
P11	m	m	m	m	m	m	m	m	-	TUNED
P12	n	n	n	n	n	n	n	n	-	RDS
P13	p	p	p	p	p	p	p	p	-	-
P14	r	r	r	r	r	r	r	r	-	-
P15	WEEKDAY	AUTO	MONO	-	-	col	-	SLEEP	kHz	MIN
P16	WEEKEND	-	-	-	-	.	-	-	MHz	CH
P17	ONCE	-	-	-	-	-	-	-	.	-
P18	REC	-	-	-	-	-	-	-	-	-

ADJUSTMENT PROCEDURES

Preparation

• Input

FM mono: 1kHz, 75kHz devi., 60dB/μV
FM stereo: 1kHz, L+R 67.5kHz devi.: Pilot signal 19kHz 7.5kHz devi.
AM: 400Hz, 30% mod.,

• Output

Connect the non-inductive type resistor of 8 ohms to the speaker terminal A of left and right channels unless otherwise noted.

• Standard knob position

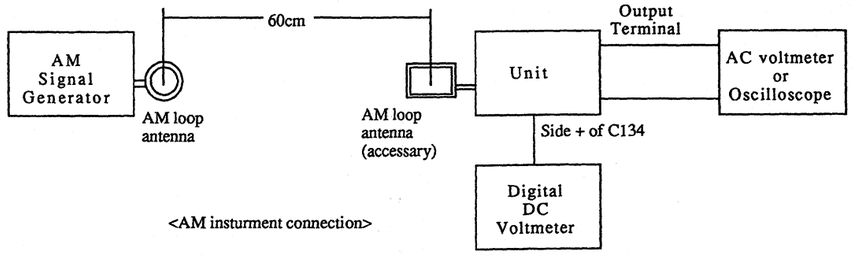
Input selector ..... CD
VOLUME ..... Maximum
BASS/TREBLE/S. BASS ..... OFF
BALANCE ..... CENTER

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
FM IF/RF	1	Fig.1	98.0MHz 1kHz 75kHz devi. 65dBf(60dB)	——	98.0MHz	DC voltmeter	L101	0±30mV	FM MUTE/MODE switch:OFF/MONO Repeat the steps 1 and 3 until no further adjustment is necessary.
	2					AC voltmeter	IFT on the front end	Maximum	
	3					Distortion analyzer	L102	Minimum	
Muting Level		Fig.3	98.0MHz 17.2dBf(12dB)	——	98.0MHz	Oscilloscope	R101	Signal output	FM MUTE/MODE switch:ON/STEREO
VCO		Fig.2	98.0MHz 1kHz 75kHz devi. 65dBf(60dB)	——	98.0MHz	Frequency counter	R201	19kHz± 10Hz	
Stereo Distortion		Fig.3	98.0MHz Ext. mod.65dBf(60dB)	Channel L or R 1kHz	98.0MHz	Distortion analyzer	IFT on the front end	Minimum	Don't turn more than ±180°.

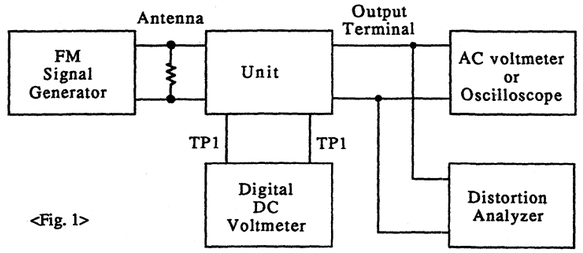
2.AM ADJUSTMENT

Step	AM SG output	Tuning Frequency	Output Indicator	Adjustment point	Adjust for
1		522kHz or 531kHz	Digital DC voltmeter	OSC coil on RF block L151	1.3±0.4V
2	603kHz 400Hz 30% mod. 60dB/m	603kHz	AC voltmeter	RF coil on RF block L151	Maximum
3	999kHz 400Hz 30% mod. 60dB/m	999kHz	AC voltmeter	L152	Maximum

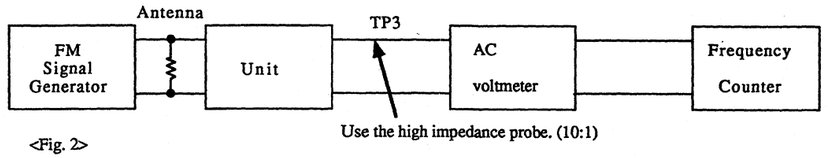
Reference Specification
FM tuned voltage:87.5MHz～108.0MHz
1.7±0.5V～7.5±0.5V
AM tuned voltage:522kHz～1611kHz
1.3±0.5V～7.5±0.5V
(230V model)
AM tuned voltage:531kHz～1602kHz
1.3±0.5V～7.5±0.5V
(Worldwide model)



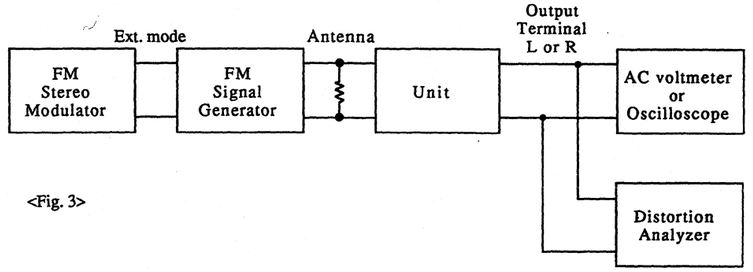
<AM insturment connection>



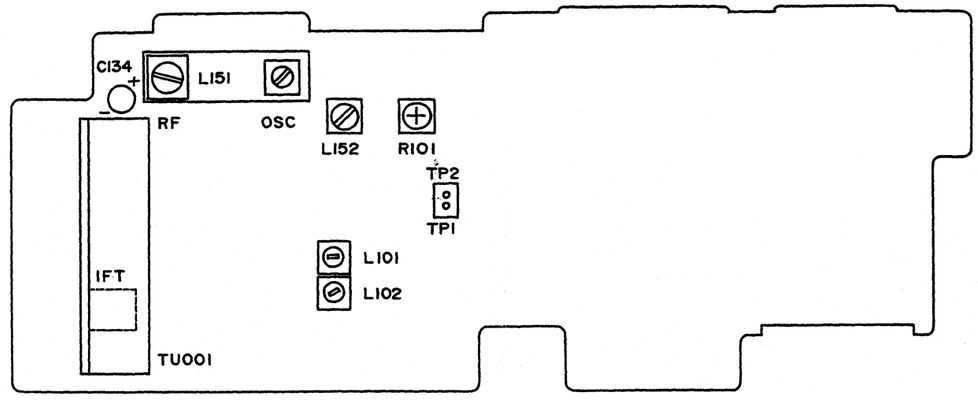
<Fig. 1>



<Fig. 2>



<Fig. 3>



PRINTED CIRCUIT BOARD-PARTS LIST

MAIN CIRCUIT PC BOARD (NAAF-5014-1/1A/2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301	22240280	LC7821N
Q445	22240025	LC4966
Q452	22240191	NJM4565D-D
Q501,Q502	22240108	μPC1225H
Q911	222780055NEC	78M05HF
Q912	222780125NEC	78M12HF
Q913	222780565JRC	78M56
	Transistors	
Q441,Q446	2212600	DTA124ES
Q442	221282	DTC144ES
Q443	2213290 or	DTC114ES or
	2214230	RN1202
Q447,Q448	2213631 or	RN1241-A or
	2213632	RN1241-B
Q503,Q504	2213284	2SC1740S-R
Q509,Q510	2212285	2SC2878-A
Q511	2212600	DTA124ES
	Diodes	
D501	223163,	1SS133,
	223205 or	1SS270A or
	223222	WG713A
D915,D916	224451303	MTZ13C
	Capacitors	
C312,C313	354780339	3.3 μF,50V,Elect.
C453,C454	393380227	2.2 μF,50V,Elect.
C457,C458	374721015	100pF±10%,50V,Plastic
C461	354742209	22 μF,16V,Elect.
C501,C502	393380227	2.2 μF,50V,Elect.
C505,C506	354741019	100 μF,16V,Elect.
C509,C510	374723334	0.033 μF±5%,50V,Plastic
C511,C512	374721244	0.12 μF±5%,50V,Plastic
C513,C514	374724734	0.047 μF±5%,50V,Plastic
C521,C522	354780229	2.2 μF,50V,Elect.
C915,C916	354761019	100 μF,35V,Elect.
C917,C918	354741009	10 μF,16V,Elect.
C921	354762229	2200 μF,35V,Elect.
C922	354761019	100 μF,35V,Elect.
C923	354741009	10 μF,16V,Elect.
C925,C926	354761019	100 μF,35V,Elect.
C927,C928	354743319	330 μF,16V,Elect.
C931,C932	3504260	4700 μF,40V,Elect.
	Resistors	
R331-R333	453530104	1 ohm±5%,1/2W,Metal
R515,R516	4500027	0.22 ohm,2W,Metal plate
R517,R518	453530824	8.2 ohm±5%,1/2W,Metal
R527,R528	443523914	390 ohm±5%,1/2W,Metal oxide
R915	443623904	39 ohm±5%,1W,Metal oxide
R916	443521204	12 ohm±5%,1/2W,Metal oxide
R918	443628204	82 ohm±5%,1W,Metal oxide
R919-R922	443622414	240 ohm±5%,1W,Metal oxide
R923	443624704	47 ohm±5%,1W,Metal oxide
R924,R925	4400012U	30 ohm±5%,2W,Metal oxide
	Wire traps	
JL401B	25050271	NSCT-7P99 <R-22>
JL402A	25050267	NSCT-3P95
JL403A	25051107	NSCT-3P894 <R-32>
	Relay	
RL501	25065339	NRL-2P5A-DC24-046
	Plugs	
P102A	25055709	NPLG-13P665
P103A	25055707	NPLG-11P663 <R-32>
P401A,P402A	25055712	NPLG-20P668
P911A	25055665	NPLG-17P621
P912A	25055663	NPLG-12P619
	Terminals	
P301	25045410	NPJ-4PDBL235
P501	25060161	NTM-4PDML087
P502	25045420	NPJ-1PDBL245 <R-32>
	Sockets	
P302	25051247	NSCT-15P1037
P701B	25051045	NSCT-9P832
P702B	25051044	NSCT-8P831
P703B	25051047	NSCT-13P834
	Switch	
S701	25065414	NSS-2215S <W>

BALANCE VOLUME PC BOARD (NAETC-5015-1/2)

CIRCUIT NO.	PART NO.	DESCRIPTION
R437,R438	5104341	N14RHC100KWT20Z,Variable resistor <R-22>
R439	5104342	N11RHC250KW20Z,Variable resistor
JL401A	25051111	NSCT-7P898,Wire holder <R-22>
JL402A	25051107	NSCT-3P894,Wire holder

TONE CIRCUIT PC BOARD (NAAF-5016-1/2)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q401,Q403	22240191	NJM4565D-D
Q402	22240191	NJM4565D-D <R-22>
	Capacitors	
C401,C402	354780339	3.3 μF,50V,Elect.
C405,C406	374723315	330pF±10%,50V,Plastic
C411,C412	374721044	0.1 μF±5%,50V,Plastic
C413,C414	354780229	2.2 μF,50V,Elect. <R-22>
C415,C416	374721044	0.1 μF±5%,50V,Plastic <R-22>
C419,C420	374725624	5600pF±5%,50V,Plastic
C421,C422	374725634	0.056 μF±5%,50V,Plastic
C425,C426	374723315	330pF±10%,50V,Plastic
C429,C430	393384799	0.47 μF,50V,Elect.
	Socket	
P402B	25051241	NSCT-20P1031

MASTER VOLUME PC BOARD (NAETC-5018-1/2)

CIRCUIT NO.	PART NO.	DESCIRPTION
Q451	22240322	LB1639,IC
D451	22380035 or	GP104003E or
	22380046	AM01Z,Diode
C452	354741009	10 μF,16V,Elect. capacitor
R452	5104339	N16RGM100KBT20F,Variable resistor
P401B	25051241	NSCT-20P131,Socket

FL TUBE PC BOARD (NADG-5020-1/1A/2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Remote sensor	
U701	24130010	HC-312
	ICs	
Q701	22240794	μPD78043GF-088
	FL tube	
Q702	212131	10-BT-136GK
	Transisrtors	
Q703	221282	DTC144ES
Q704	2212600	DTA124ES
	Diodes	
D701	224450683	MTZ6.8C
D702	224450562	MTZ5.6B
D706-D712	223205,	1SS270A,
	223163 or	1SS133 or
	223222	WG713A
	LEDs	
D703	225292D	SEL4310G-D
D704,D705	225291D	SEL4910D-D
	X'tal	
X701	3010224	XTL-4.19M
	Coil	
L701	233454K220	NCH-1452 220K
	Capacitors	
C701	353781009	10 μF,50V,Elect.
C704	3000075	0.047F, 5.5V, Super
C706	375524744	0.47 μF±5%,50V,Plastic
C709	354780109	1 μF,50V,Elect.
C710	354742209	22 μF,16V,Elect.
C714	354744709	47 μF,16V,Elect.
C715	354741009	10 μF,16V,Elect.
R735	49121104412	100 kohm×12, Array
	Switches	
S701-S712	25035652	NPS-111-S604
	Plugs	
P701A	25055658	NPLG-9P614
P702A	25055657	NPLG-8P613
P703A	25055660	NPLG-13P616
	Jack	
P705	25045396	LGT1516-0101
	Holder	
Q702A	27190943	FL tube

TUNER CIRCUIT PC BOARD (NARF-5021-1/2)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240089	FE415-G11
	ICs	
Q104	22240039	LA1266
Q131	22240090	LM7001
	Transistors	
Q101	2210746	2SC945A-P
Q102	2211723	2SC1923-O
Q132	2212445	2SK365-GR
Q133	2213284 or	2SC1740S-R or
	2212115	2SC2458-GR
Q134,Q135	2213510 or	DTA114ES or
Q227	2214350	RN2202
Q225,Q226	2212794	2SD1468-R
	Diodes	
D103	223205,	1SS270A,
	223163 or	1SS133 or
	223222	WG713A
D131	224450512	MTZ5.1B
	Coils and transformers	
L101	233401	NFIF-4072
L102	233402	NFIF-4073
L103	233454M022	NCH-1452 022M
L104	233383	NMC-6070
L151	232148	NMRF-7050
L152	232139	NMIF-4062
	Ceramic filters	
X101,X102	3010071	SFE10.7MA5
X103	3010130	SFE10.7MZ2A
X151	3010123	SFZ-450JL
X153	3010076	BFU-450C
	Crystal	
X131	3010141	XTL7.2M

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C001	354741019	100 μF,16V,Elect.
C108	354741019	100 μF,16V,Elect.
C112	354780229	2.2 μF,50V,Elect.
C113	354784799	0.47 μF,50V,Elect.
C132	374723334	0.033 μF±5%,50V,Plastic
C133	354780229	2.2 μF,50V,Elect.
C134	354782299	0.22 μF,50V,Elect.
C138,C152	354721019	100 μF,6.3V,Elect.
C139	354741019	100 μF,16V,Elect.
C154	354780479	4.7 μF,50V,Elect.
C155-C157	354741009	10 μF,16V,Elect.
C160	374721034	0.01 μF±5%,50V,Plastic
C161	354782299	0.22 μF,50V,Elect.
C227	354780229	2.2 μF,50V,Elect.
	Resistor	
R101	5210266	N06HR100KBC,Trim
	Terminal	
P101	25060197	NTM-2PDMN119
	Sockets	
P102B	25051238	NSCT-13P1028
P103B	25051236	NSCT-11P1026
	Plug	
TP101	25055038	NPLG-2P29

STEREO DECODER PC BOARD (NAAF-5022-1/1A/2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q201	22240242	AN7470
Q351	22240191	NJM4565D-D <R-32>
	Diodes	
D201-D203	223205,	1SS270A,
	223163 or	1SS133 or
	223222	WG713A
	Coils	
L201,L202	233355A	NMC-4059
	Capacitors	
C201	354744719	470 μF,16V,Elect.
C202	354742209	22 μF,16V,Elect.
C205	354782299	0.22 μF,50V,Elect.
C206	354780109	1 μF,50V,Elect.
C207	354780339	3.3 μF,50V,Elect.
C208	370134714	470pF±5%,50V,Plastic
C209	374724734	0.047 μF±5%,50V,Plastic
C211,C212	374721224	1200pF±5%,50V,Plastic <P>
	374721524	1500pF±5%,50V,Plastic <W>
C213,C214	354742209	22 μF,16V,Elect.
C215,C216	354741009	10 μF,16V,Elect.

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C217,C218	374724724	4700pF±5%,50V,Plastic <P>
	374725624	5600pF±5%,50V,Plastic <W>
C220	374724734	0.047 μF±5%,50V,Plastic
C359,C360	354741009	10 μF,16V,Elect. <R-32>
	Resistor	
R201	5210261	N06HR5KBC,Trim
	Socket	
P201	25051245	NSCT-13P1035 <R-32>
	Plug	
JL403B	25055038	NPLG-2P29

POWER SOURCE PC BOARD (NAPS-5023-1/1A/2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q512,Q513	2213650	DTD113ZS
Q901	2211455	2SA1015-GR
	Diodes	
D901	223205,	1SS270A,
	223163 or	1SS133 or
	223222	WG713A <R-32>
D903-D910	22380046 or	AM01Z or
	22380035	GP104003E
D911	22380022F	RBV402
D912	224452704	MTZ27D
D913	224451203	MTZ12C
	Capacitors	
C901	3500065A	⚠ DE7150FZ103P1C400V/125V,IS
C902	3500065A	⚠ DE7150FZ103P1C400V/125V,IS <P> <R-32>
C906	354784709	47 μF,50V,Elect.
C908	354780339	3.3 μF,50V,Elect.
C909-C911	354781019	100 μF,50V,Elect.
C912,C913	354771019	100 μF,63V,Elect.
C951,C952	374721044	0.1 μF±5%,50V,Plastic
	Resistors	
R901	453534794	0.47 ohm±5%, 1/2W,Metal
R902,R903	443521024	1 kohm±5%, 1/2W,Metal oxide
R904	443522704	27 ohm±5%, 1/2W,Metal oxide
R907,R908	4400012U	30 ohm±5%, 2W,Metal oxide
	Fuses	
F901	252071	⚠ 1.25A-SE-EAK,Primary
F902	252075	⚠ 2.5A-SE-EAK,Primary <W>
F903	252071	⚠ 1.25A-SE-EAK,AC outlet <P> <R-32>
	Fuseholders	
F901A	25050065	⚠ YSH403T
F902A	25050065	⚠ YSH403T <W>
F903A	25050065	⚠ YSH403T <P> <R-32>
	Cover	
C901A	27301216	⚠ for C901 <P>

CIRCUIT NO.	PART NO.	DESCRIPTION
	Plug	
P901A	25055713	NPLG-2P669
	AC outlet	
P903	25050410	⚠ NSCT-2P235 <R-32>
	Sockets	
P911B	25051054	NSCT-17P841
P912B	25051052	NSCT-12P839
	Relay	
RL901	25065341	⚠ NRL-1P15A-DC24-047
	Switch	
S901	25035550	⚠ NPS-111-L512P

VOLTAGE SELECTOR SWITCH PC BOARD (NASW-5024-1/2)

CIRCUIT NO.	PART NO.	DESCRIPTION
S903	25065437	⚠ NSS-22157P,Slide switch

TUNING SWITCH PC BOARD (NASW-5033-1/2)

CIRCUIT NO.	PART NO.	DESCRIPTION
S751	25030376	NRSF-112-20F,Rotary switch

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

SERVICE PROCEDURES

1. Replacing the fuses

For continued protection against fire hazard, replace only with same type and same rating fuse.

CircuitNo.	PartNo.	Description
F901	252071	1.25A-SE-EAK, Primary fuse
F902	252075	2.5A-SE-EAK, Primary fuse 〈W〉
F903	252073	1.6A-SE-EAK, AC outlet fuse 〈P〉

NOTE: 〈P〉 :Only 230V model
〈W〉 :Only Worldwide model

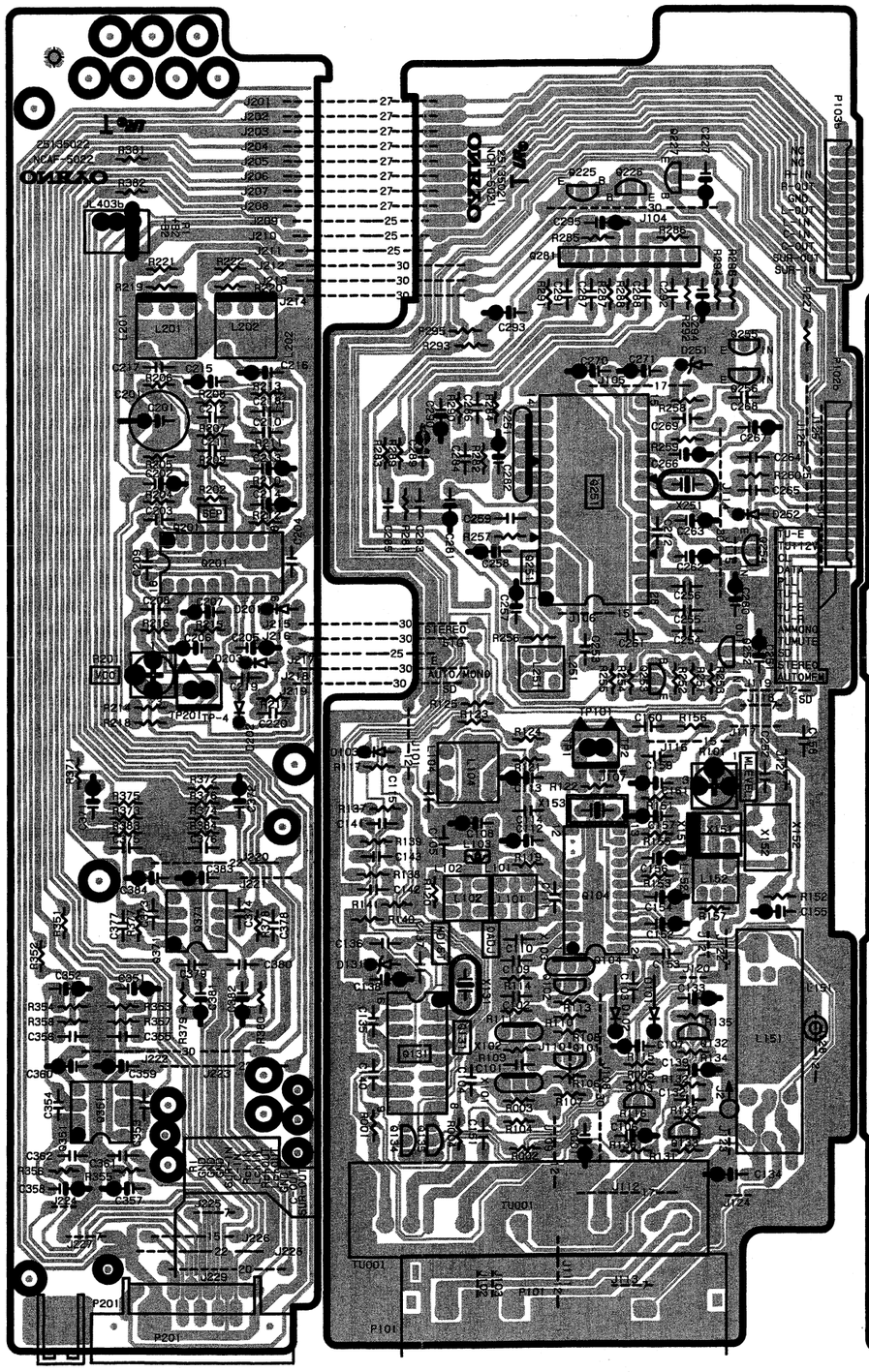
2. Memory preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

3. Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.
This switch is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

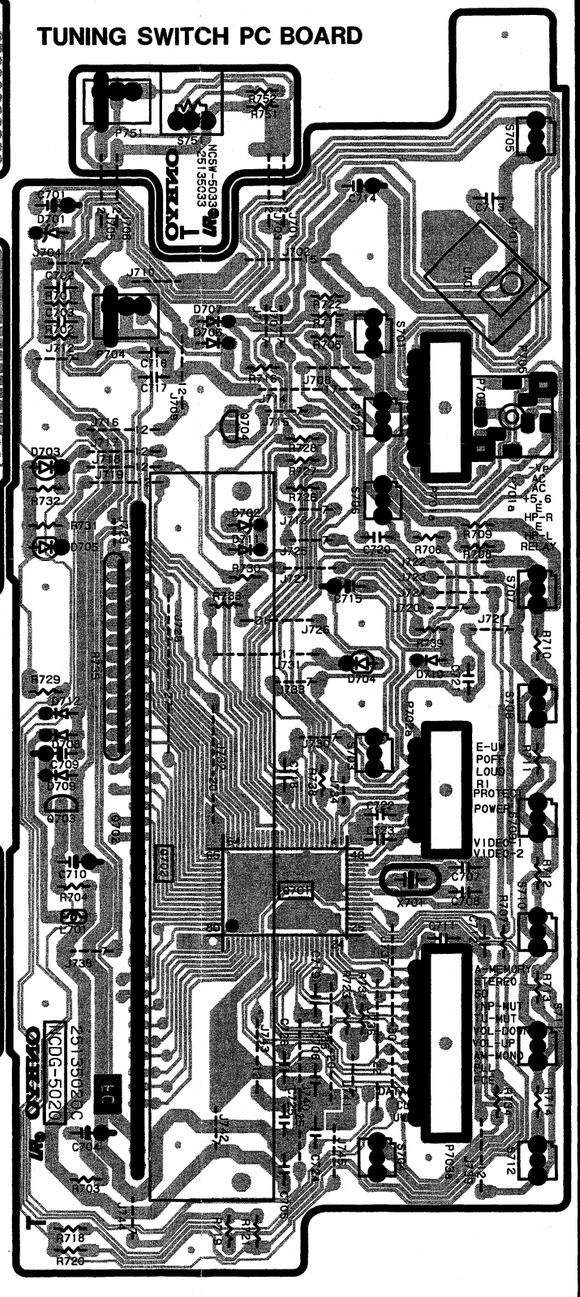
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



STEREO DECODER PC BOARD

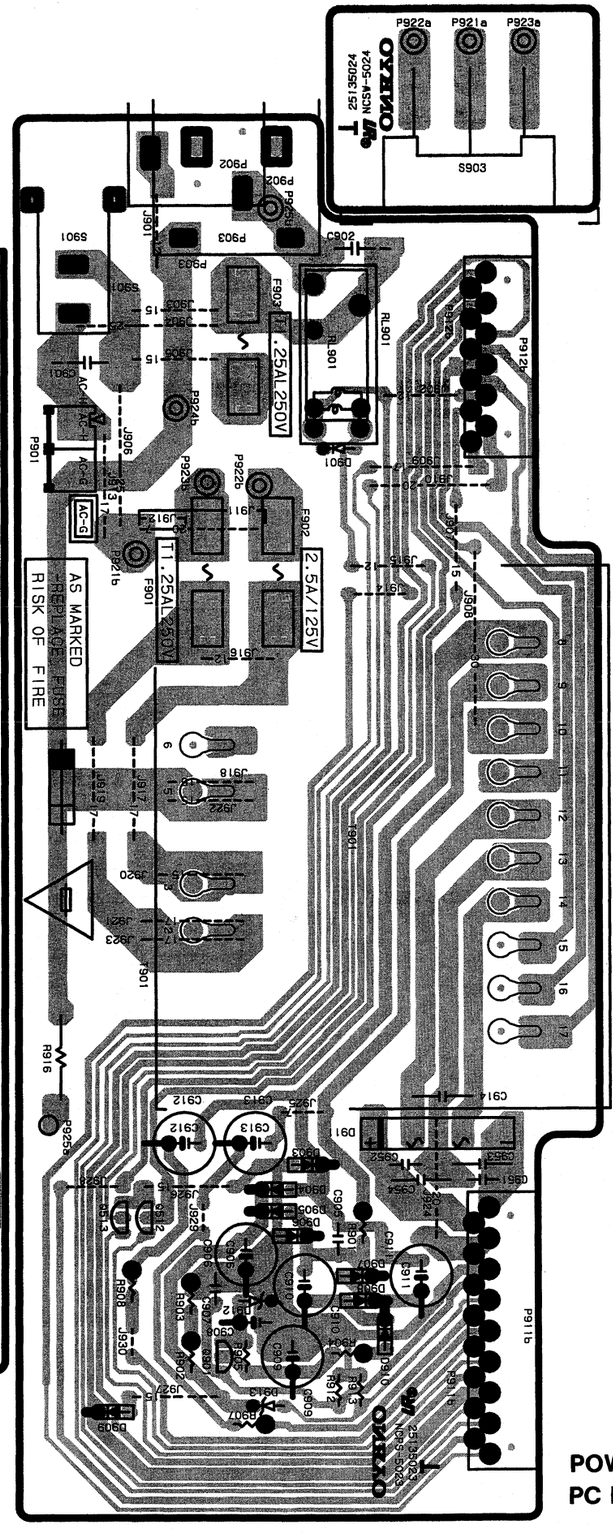
TUNER CIRCUIT PC BOARD

TUNING SWITCH PC BOARD



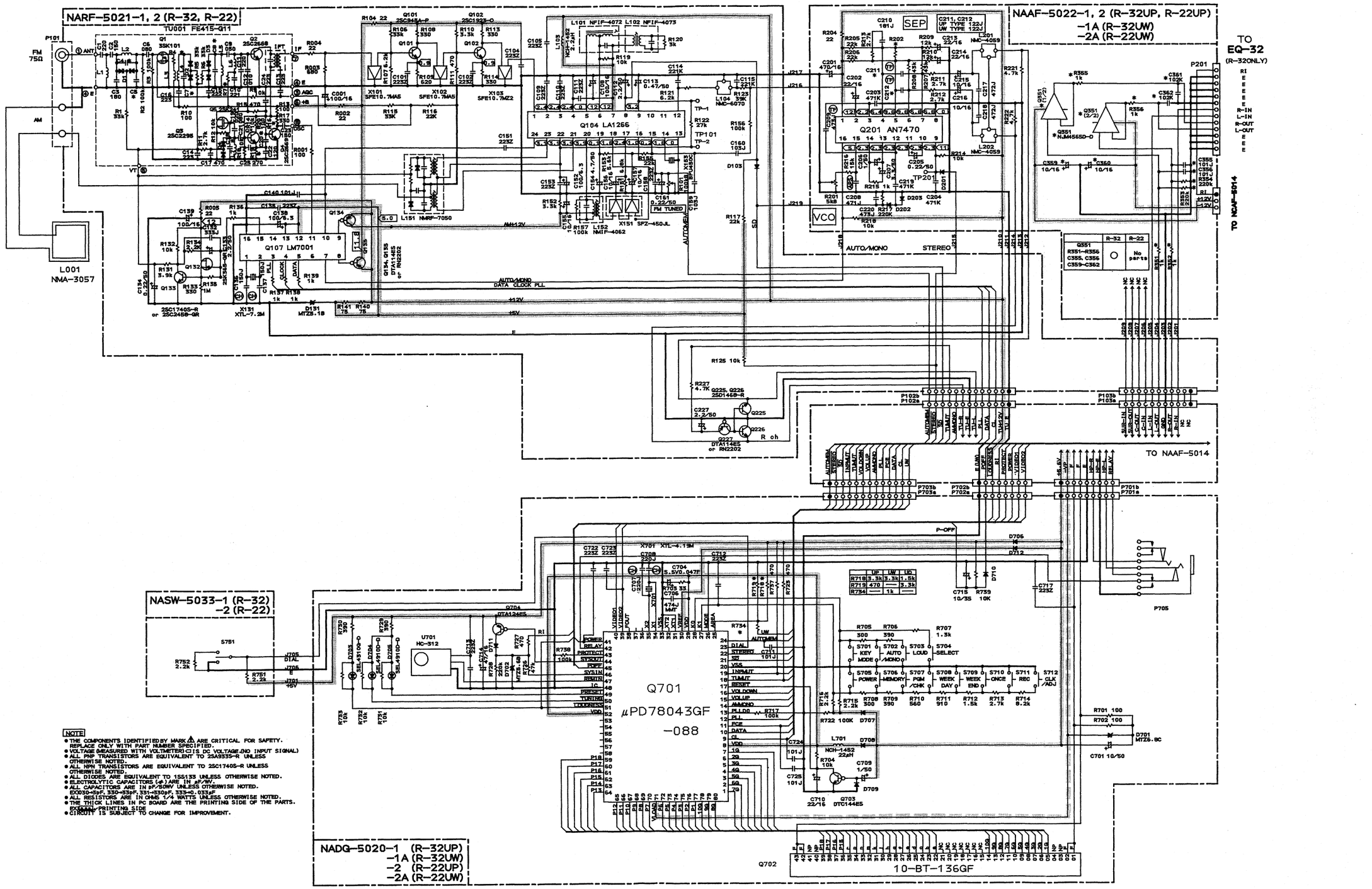
FL TUBE PC BOARD

VOLTAGE SELECTOR SWITCH PC BOARD



POWER SOURCE PC BOARD

SCHEMATIC DIAGRAM
TUNER SECTION



NOTE
- THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
- VOLTAGE MEASURED WITH VOLTMETER/CI'S DC VOLTAGE (NO INPUT SIGNAL)
- ALL PNP TRANSISTORS ARE EQUIVALENT TO 2SA933S-R UNLESS OTHERWISE NOTED.
- ALL NPN TRANSISTORS ARE EQUIVALENT TO 2SC1740S-R UNLESS OTHERWISE NOTED.
- ALL DIODES ARE EQUIVALENT TO 1SS133 UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (◆) ARE IN μF/W.
- ALL CAPACITORS ARE IN pF/50WV UNLESS OTHERWISE NOTED. ED0030-39pF, 330-339pF, 331-330pF, 333-0.033μF
- ALL RESISTORS ARE IN Ω 1/6 T-4 WATTS UNLESS OTHERWISE NOTED.
- THE THICK LINES IN PC BOARD ARE THE PRINTING SIDE OF THE PARTS. EXCEPT PRINTING SIDE
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

SCHEMATIC DIAGRAM
AMPLIFIER SECTION

NAAF-5014-1 (R-32UP)
/-1A (R-32UW)
/-2 (R-22UP)
/-2A (R-22UW)

NAETC-5018-1 (R-32)
/-2 (R-22)

NAAF-5016-1 (R-32)
/-2 (R-22)

SUPER BASS

MAIN AMP

SPEAKERS

PARTS NUMBER \ SET NAME	32UP	32UW	22UP	22UW
RS21-RS28 P103, PS02, P903 C902, D901 P303, RL901 JL403, JL403a	○	○	No parts	No parts
R435-R439 R419-R424 C435-C436 C419-C418 Q402	No parts	No parts	○	○
S701	No parts	○	No parts	○
R425, R426	10K	10K	18K	18K
R413, R414	470	470	560	560
C421, C422	563J	563J	475J	475J

NASW-5024
-2 (R-22UW)

NAPS-5023
-2A (R-22UW)

NASW-5024
-1 (R-32UW)

NAPS-5023
-1A (R-32UW)

NADG-5020-1 (R-32UP)
/-1A (R-32UW)
/-2 (R-22UP)
/-2A (R-22UW)

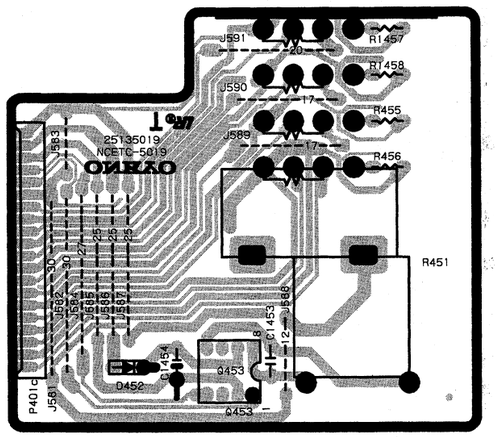
DG SECTION

NAETC-5015-1
/-2 (R-22)

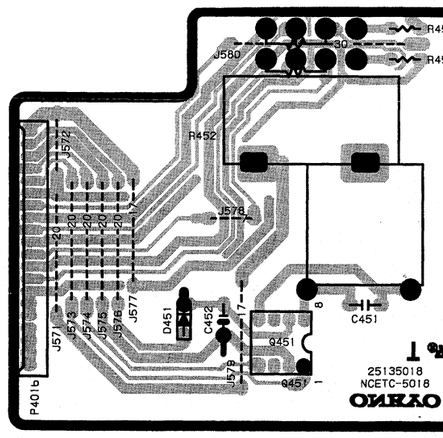
NAPS-5023-1 (R-32UP)
/-2 (R-22UP)

ONKYO CORPORATION

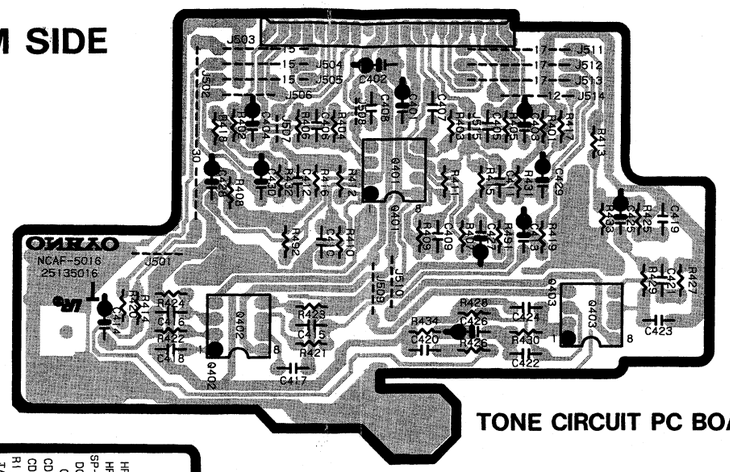
PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



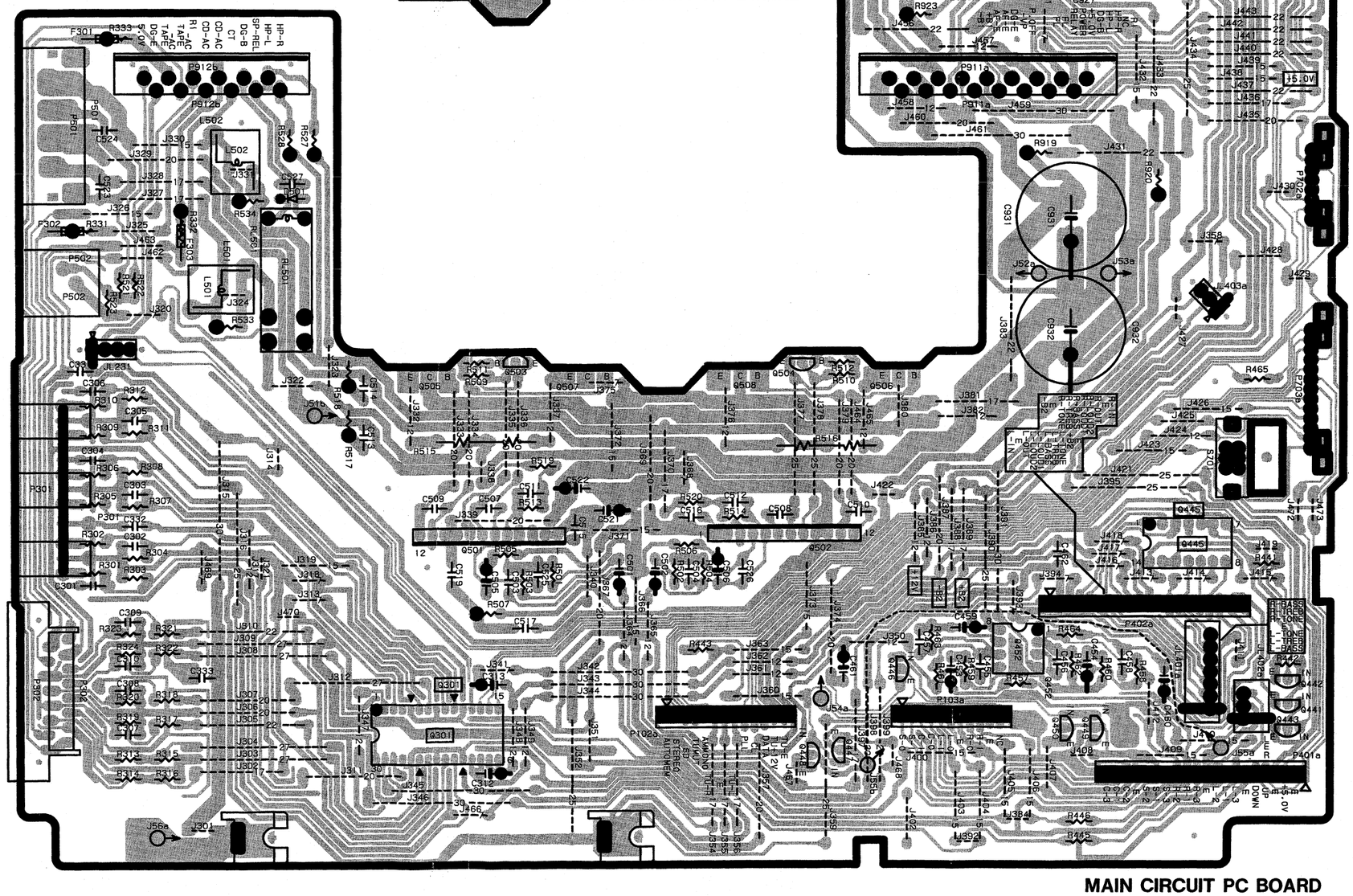
MASTER VOLUME PC BOARD



BALANCE VOLUME PC BOARD



TONE CIRCUIT PC BOARD

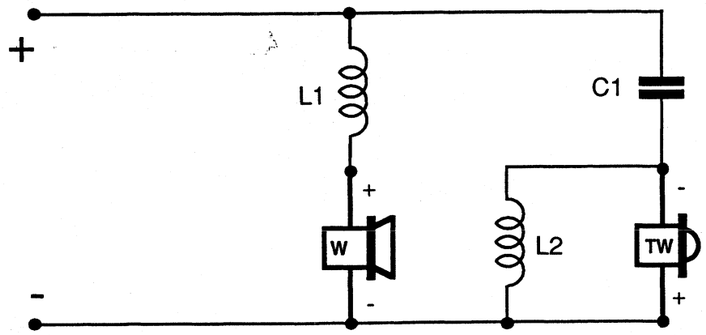


MAIN CIRCUIT PC BOARD

PS-32 1. PARTS LIST

DESCRIPTION	PART NO.
Loudspeaker a'ssy	BEE1211A
Box a'ssy	BXAS490A
Grill a'ssy	DLAS1235
Badge	MK377

2. SCHEMATIC DIAGRAM



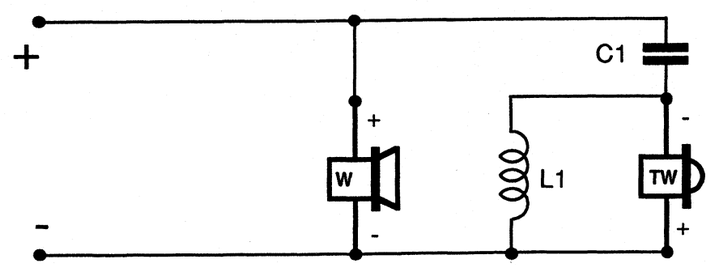
L1 : 0.40mH
L2 : 0.40mH
C1 : 3.9µF

Crossover frequency 4200Hz

PS-22 1. PARTS LIST

DESCRIPTION	PART NO.
Loudspeaker a'ssy	BEE1210A
Badge	28135197A

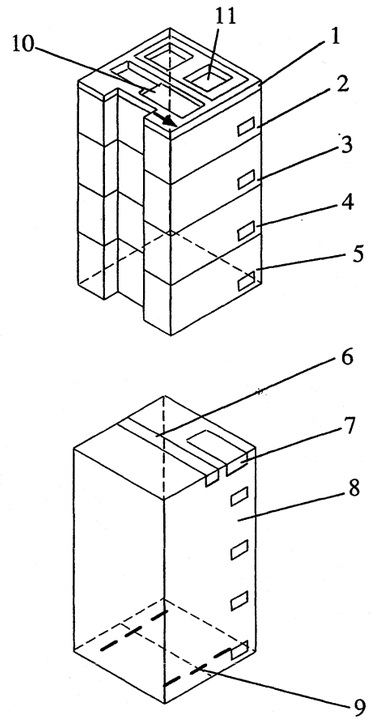
2. SCHEMATIC DIAGRAM



L1 : 0.40mH
C1 : 3.9µF

Crossover frequency 4200Hz

PACKING VIEW



Ref. No.	Part Name	MP-22SUP	MP-22SUPV	MP-22SUW	MP-22BUP	MP-22BUPV	MP-22BUW	MP-32SUP	MP-32SUPV	MP-32SUW	MP-32BUP	MP-32BUPV	MP-32BUW
1	Pad F	29091669	←	←	←	←	←	←	←	←	←	←	←
2	Equalizer							EQ-32SUP	←	EQ-32SUW	EQ-32BUP	←	EQ-32SUW
	Styren bag							29100037-1Y	←	←	←	←	←
	Pad							29091667	←	←	←	←	←
	Pad							29091670	←	←	←	←	←
3	Cassette Deck	K-22SU	←	←	K-22BU	←	←	K-32SUP	←	←	K-32BUP	←	←
	Styren bag	29100037-1Y	←	←	←	←	←	←	←	←	←	←	←
	Pad	29091668A	←	←	←	←	←	←	←	←	←	←	←
4	CD Player	C-32SU	←	←	C-32BU	←	←	C-32SUP	←	←	C-32BUP	←	←
	Styren bag	29100037-1Y	←	←	←	←	←	←	←	←	←	←	←
	Pad	29091667	←	←	←	←	←	←	←	←	←	←	←
5	Tuner Amplifier	R-22SUP	←	R-22SUW	R-22BUP	←	R-22BUW	R-32SUP	←	R-32SUW	R-32BUP	←	R-32BUW
	Styrene bag	29100037-1Y	←	←	←	←	←	←	←	←	←	←	←
	Pad	29091668A	←	←	←	←	←	←	←	←	←	←	←
6	PP tape	29110071	←	←	←	←	←	←	←	←	←	←	←
7	Warranty card		29365020J			29365020J			29365020J			29365020J	
	Bag for warranty card		29100094B			29100094B			29100094B			29100094B	
8	Carton box	29052775A	←	←	29052776A	←	←	29052773A	←	←	29052774A	←	←
9	Staples	282321	←	←	←	←	←	←	←	←	←	←	←
10	Remote control(RC-271S)	24140271	←	←	←	←	←	←	←	←	←	←	←
11	Accessary bag ass'y												
	Instruction manual U3	29341969	←	←	←	←	←	←	←	←	←	←	←
	Instruction manual U2	29341970			29341970			29341970			29341970		
	Instruction manual U2	29341971			29341971			29341971			29341971		
	FM antenna	292112	←	←	←	←	←	←	←	←	←	←	←
	AM loop antenna	232140	←	←	←	←	←	←	←	←	←	←	←
	Two batteries	3010054	←	←	←	←	←	←	←	←	←	←	←
	Connection cord (45P)	2009990332	←	←	←	←	←	←	←	←	←	←	←
	Connection cord (26P)							2009990334	←	←	←	←	←
	Conversion plug			25055040			25055040			25055040			25055040
	FM antenna adaptor			25065462			25065462			25065462			25065462
	Styren bag	29100097-1Y	←	←	←	←	←	←	←	←	←	←	←

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SPECIFICATIONS

Tuner Amplifier R-32/22

Amplifier section

Power Output:	30 watts per channel min. RMS. at 6 ohms both channels driven, from 40 Hz to 20 kHz with no more than 0.5% THD.
Continuous Power Output:	2 × 35 watts at 6 ohms, 1 kHz (DIN)
Total Harmonic Distortion:	0.5% at rated power
IM Distortion:	0.5% at rated power
Damping Factor:	40 at 6 ohms
Frequency Response:	40 – 20,000 Hz ± 3 dB
Sensitivity and Impedance:	
CD/Tape Play:	150 mV/50 kohm
Tape Rec:	150 mV/2.2 kohms
Signal-to-Noise Ratio:	
CD/Tape:	100 dB (IHF-A)
Tone Controls:	
Super Bass:	+ 10 dB at 60 Hz
Bass:	± 10 dB at 100 Hz
Treble:	± 10 dB at 10 kHz
Muting:	– 45 dB

Tuner section:

FM:

Tuning Range:	
European models:	87.5 – 108.0 MHz (50 kHz steps)
Worldwide models:	87.5 – 108.0 MHz (50 kHz steps) 87.9 – 107.9 MHz (200 kHz steps)
Usable Sensitivity:	
Mono:	11.2 dBf. 1.0 μV, 75 ohms 0.9 μV (S/N 26 dB, 40 kHz Devi.) 75 ohms DIN
Stereo:	18.0 dBf, 2.2 μV, 75 ohms 23 μV (S/N 46 dB. 40 kHz Devi.) 75 ohms DIN
50 dB Quieting Sensitivity:	
Mono:	18.2 dBf, 2.2 μV, 75 ohms
Stereo:	37.2 dBf, 20 μV, 75 ohms
Capture Ratio:	1,5 dB
Image Rejection Radio:	85 dB (European and worldwide models) 40 dB (USA and Canadian models)
IF Rejection Ratio:	90 dB
Signal-to-Noise Ratio:	
Mono:	73 dB
Stereo:	66 dB
Selectivity:	50 dB DIN (± 300 kHz, 40 kHz Devi.)
AM Suppression Ratio:	50 dB
Harmonic Distortion:	
Mono:	0.15%
Stereo:	0.30%
Frequency Response:	30 – 15,000 Hz ± 1.5 dB
Stereo Separation:	40 dB at 1 kHz

AM:

Tuning Range:	
European models:	522 – 1611 kHz (9 kHz steps)
Worldwide models:	531 – 1602 kHz (9 kHz steps) 530 – 1710 kHz (10 kHz steps)
Usable Sensitivity:	30 μV
Image Rejection Ratio:	40 dB
IF Rejection Ratio:	40 dB
Signal-to-Noise Ratio:	40 dB
Harmonic Distortion:	0.8 %

General

Power Supply:	
European model:	AC 230 V, 50 Hz
Worldwide models:	AC 120 and 220 V switchable,50/60Hz
Dimensions:	275 (W) × 118 (H) × 321 (D) mm 10-13/16" × 4-5/8 × 12-5/8"
Mass:	5.3 kg (11.7 lbs.)

CD player C-32

Signal readout system:	Optical non-contact
Reading rotation:	About 500 – 200 r.p.m. (constant linear velocity)
Linear velocity:	1.2 – 1.4 m/s
Error correction system:	Cross Interleave Reed-Solomon code
D/A converter:	1 BIT PWM
Sampling frequency:	352.8 kHz (8 times oversampling)
Number of channels:	2 (stereo)
Frequency response:	5 Hz – 20 kHz
Harmonic distortion:	0.005 % (at 1 kHz)
Dynamic range:	96 dB
Signal to noise ratio:	90 dB
Channel separation:	90 dB (at 1 kHz)
Wow and Flutter:	Below threshold of measurability
Dimensions:	275 (W) × 79 (H) × 308 (D) mm 10-13/16" × 3-1/8" × 12-1/8"
Mass:	2.3 Kg (5.1 lbs.)

Cassettedeck K-32/22

Track System:	4-tracks, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.) 9.6 cm/sec. (3-3/4 i.p.s.) (high speed dubbing)
Wow and Flutter.	0.09% (WRMS)
Frequency Response:	20 – 15,000 Hz (Normal) (30 – 14,000 Hz ± 3 dB) 20 – 16,000 Hz (High) (30 – 15,000 Hz ± 3 dB) 20 – 17,000 Hz (Metal) (30 – 16,000 Hz ± 3 dB)
S/N Ratio:	Dolby NR off 58 dB (metal position tape) A noise reduction of 10 dB above 5 kHz and 5 dB at 1 kHz is possible with Dolby B NR. A noise reduction of 20 dB at 5 kHz is possible with Dolby C NR.
Motors:	DC servo motor × 2
Heads:	REC/PB:1 PB: 1 ERASE:1
Dimensions:	275 (W) × 118 (H) × 302 (D) mm 10-13/16" × 4-5/8" × 11-7/8"
Mass:	3.0 kg (6.6 lbs.)

Graphic equalizer EQ-32

Total harmonic distortion:	Less than 0.05 % at 20 Hz - 20kHz, 1.5 V output (FLAT)
Signal to noise ratio:	100 dB, 1.5 V output, IHF-A input short
Adjustable range:	± 12 dB
Gain:	0 dB
Power supply:	
European model	AC 230 V, 50 Hz
Worldwide models	AC 120 and 220 V switchable, 50/60 Hz
Dimensions:	275 (W) × 79 (H) × 302 (D) mm 10-13/16" × 3-1/8" ×11-7/8"
Mass:	2.5 kg (5.5 lbs.)

Remote control RC-271S

Transmitter:	Infrared
Signal range:	Approx. 5 meters (16 ft. 4")
Power supply:	Two "AA" batteries (1.5 V × 2)

Speaker system PS-32

Type:	2-Way, Bass Reflex
Speakers	
Woofer:	15 cm Cone type
Tweeter:	7 cm Cone type
Impedance:	6 ohms
Max. Input Power:	80 W
Frequency Range:	40 Hz – 20 kHz
Output sound pressure level	90 dB
Dimensions:	206 (W) × 394 (H) × 291 (D) mm (8-1/8" × 15-1/2" × 11-7/16")
Mass:	5.3 kg (11.7 lbs.)

Speaker system PS-22

Type:	2 -Way, Bass Reflex
Speakers	
Woofer:	15 cm Cone type
Tweeter:	7 cm Cone type
Impedance:	6 ohms
Max. Input Power:	80 W
Frequency Range:	48 Hz – 20 kHz
Output sound pressure level:	89 dB
Dimensions:	182 (W) × 315 (H) × 221 (D) mm (7-3/16" × 12-3/8" × 8-11/16")
Mass:	3.3 kg (7.3 lbs.)

Design and specifications are subject to change without prior notice.

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